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The Society is not responsible, as a body, for the facts and opinions advanced in the papers published by it. Editorials are by the Editor-in-Chief unless otherwise indicated and do not necessarily represent the opinion of the Society as a whole. The "leaders" preceding major articles are to be regarded as editorial additions.

EDITORIAL

WHO SHOULD OWN OUR TIMBER?

THERE was a time when it was good business for an individual or company to own large tracts of virgin timber. That day, it becomes more evident every month, has passed and economic forces that prevent its return appear to be at work. In fact it passed soon after the close of the World War, but only a few were aware of it or would admit it; the present economic crisis and the very acute financial distress of the lumber industry simply force its recognition.

A clear distinction must be made between properties paid for and free from debt and those heavily bonded. The owner of the former is fortunate indeed in times of stress. Still more fortunate would he be if he owned no timber at all and could buy and pay for it only as he needs it for his mill. One who owns only a sawmill is more likely to operate it in consonance with market requirements. But if he owns in addition a large reserve of timber his operation of the mill is too often dictated by the demands of his bondholders for interest payments, the banks for the payment of notes, and the county for the taxes. Taxes alone, under our present system, may impel logging and milling operations against actual lumber

market needs. The outlook for the owner of a twenty-year or larger supply, whether paid for or not, is anything but bright and every tax or interest bill makes his situation worse.

So much has been said about the abandonment of marginal farms and of cut-over lands for taxes that many people are not aware that heavily timbered lands also are going delinquent. This is particularly true in the Northwest. Even in California, usually regarded as better off than other western states, there are heavy delinquencies. Unless there is an early and great increase in business this year, which is an improbability, these current delinquencies are certain to be aggravated by another year's tax bills and further delinquency. Since some counties will insist on collecting the penalties for delinquency, there is rapidly built up a load that the timber can not bear. Some owners sincerely believe that their timber can never return the cost of carrying it and are therefore considering relinquishing a part or all of it.

Foresters have long pointed out that the public has a stake in the way private lands are managed. Many private owners acknowledge such an interest. But no one

has yet been able to show that the average private owner can afford to protect the public's interest and at the same time cut a crop of logs at a profit. The cost of owning timber is responsible in large measure for its premature liquidation and wasteful utilization, for the wreckage of the land and the neglect of the public interests involved. It is obvious that under such conditions private ownership of timber can result only in a kind of exploitation that is contrary to the public welfare. Certainly, one can expect little more than a minimum of fire protection during exploitation, none thereafter and no forestry.

There are some timber tracts whose private ownership is highly desirable. By virtue of location, soil, climate, character of the timber, markets and other factors plus freedom from burdensome debts and unreasonable taxation, the private owner can show a profit, can weather bad depressions, and could institute acceptable forestry practices. With a changed system of taxation other properties might be added to this category. Private ownership of such properties should be conducive to the most economical and least wasteful exploitation, provided that the control of production to fit consumption is permitted. On such properties one might expect also a more rapid and greater improvement in practical forestry technique than is possible under public management. But taxation as now assessed on merchantable growth is an ever-present threat of mischief and should be changed as suggested editorially in the December 1932 number of this JOURNAL.

The remaining tracts, from a commercial and public interest standpoint, are submarginal in private ownership. These are the areas upon which the forestry profession should concentrate its attention. Public control or regulation of private timberland has long been suggested as the only solution to safeguard public interests. It is, however, a cumbersome, irritating and expensive palliative and does not

strike at the root of the trouble—the control of the land. Before we dictate how they shall be managed, let us ask *who* should own them? If the returns from lumbering remain unprofitable and the system of taxation is not to be changed, there is but one answer—the Public, in the person of state or federal government. Only from such unified and centralized control can we expect regulation of production; the safeguarding of the public's interest in maintaining the continued productivity of the forest soil, the protection of the watershed, recreational and scenic values; the permanence of lumbering communities and the profitableness of their industries. Public ownership seems to offer the private owner himself, and certainly the public, the greatest advantage in the long run. If public ownership does not materialize, some form of public regulation is certain to follow.

The next question we might ask is "How can the sub-marginal lands be returned to public ownership with fairness to the owner and benefit to the public?" Several methods have been proposed. Of course, we could wait for tax defaults to return the lands to the public, but that would be an expensive and unfair process. Besides, it would not help matters to have the lands revert to counties hard up for cash and willing to sell to anyone without restrictions. Somebody must take up the tax losses.

Section 7 of the Clarke-McNary Law provides for turning timberland over to the government. We have heard very little about this section even though it offers a good starting point for sample negotiations. Its possibilities have not been explored. Another method would be through the timber exchange law, though this may not apply so well to timbered lands as to cut-over lands. The Clarke-McNary Law at present seems to offer the only available machinery. It is worth more attention and study. If it is found wanting, we

will at least learn what a new law should contain.

Whatever method is followed we should remember that the owner has certain equities that deserve protection. On the other hand the public cannot take over lands at what some of them cost their present owners, and it should not be made to assume the burdens of another's errors.

It is probable that the lumber industry will soon present to Congress a bill urging and providing for the re-acquisition of private forest lands—timbered and cut-over. Whatever the specific provisions, they will not suit everyone. Let those of us who disagree take a broad view and regard the bill at least as a starting point for discussion before we condemn it or hold it under suspicion because initiated by a group that expects to benefit from it. It is to the discredit of the forestry profession that the initiative and leadership should not come from it. We lost a golden opportunity for leadership once before when we let the initiative in getting the Timber Conservation Board created slip from us. Although we talked about the

need for such a body for some time we did nothing to bring it about. Let us not lose the present opportunity, but if we do, let us at least show good sportsmanship and prove our intelligence and knowledge by a spirit of coöperation. Perhaps we can devise an even better way than re-acquisition, one that would make private ownership profitable to the owner and desirable to the public.

These things seem certain—except in isolated cases the private ownership of timber is a liability and never will be anything else. If present unfavorable conditions that make it so are allowed to persist, our timberland will continue to be destroyed (there is no milder word for it), it will ultimately be thrust upon the public in a wrecked condition and we will have the enormously expensive job of rehabilitating it. There will be no forestry until it is too late. Is the forestry profession going to continue to view the problem in a general light or will it give it specific thought and study and offer a workable solution?

ADDRESS OF THE PRESIDENT

BY CHRISTOPHER M. GRANGER

President, Society of American Foresters

IN THE unexpected absence of President Granger the annual meeting was opened by Vice-President John D. Guthrie. Having been notified on such short notice of the necessity of his presiding, Mr. Guthrie made no opening address but read the following brief message (prepared on the train back to Washington) from Mr. Granger:

Please express to the meeting my profound regret at not being present and my hope that in both interest and achievement it may surpass even the high mark set by the 1927 meeting in San Francisco.

The current questioning of earlier ideas about forestry, the use of and need for wood, etc., is a good thing and should not be regarded as a defeatist attack nor state of mind. On the contrary, it shows that the profession has not lapsed into complacency or become static. It is a constructive thing to have challenges come both from within our own ranks and from outsiders. The more we voluntarily or under pressure examine and re-examine our policies and programs, the

more likely are we to keep on the right road.

Neither forestry in general nor the National Forests is "on trial." On the contrary, the widespread recognition of the importance and the possibilities of forestry in the solution of the land use problem gives forestry a firmer foundation and a wider support than it ever had before. The President's reorganization scheme, just announced, and the statements of President-elect Roosevelt, combine to establish forestry, just where it belongs in the land economy of the Nation. What more could foresters ask for in that respect? Despite slow progress in private forestry, there are many signs that it is no dodo.

Therefore, let us re-appraise the situation, not with any fear of defeatism in our minds, but with the purpose of making sure that we are up to date in our thinking and prepared and able to meet ever-changing situations and to take full advantage of the widening opportunity and widening support that is offered us.

Very best wishes for a bang-up meeting.

SOME CRITICAL ISSUES IN FORESTRY¹

By HENRY S. GRAVES

Dean, School of Forestry, Yale University

This, the key-note address at the 32nd annual meeting of the Society, is an estimate of current issues affecting forestry as they appear to the author. Dean Graves believes that the outstanding obstacle to a sound system of forestry is the character of ownership of the forests which forces premature exploitation and throws cut-over land on an unprepared public; that the sale of public timber as a cause of over-production is grossly exaggerated; that the government should contribute to national forest counties more nearly in accord with the plan of taxing private properties; that mergers of forest properties should be encouraged though their influence would be largely regional; that the anti-trust laws need modification; that state control of production merits approval if it promotes stable land management and sustained yield; that larger public ownership of timber land is essential, but the acquisition of private mature timber seems impractical. Dean Graves' recital shows that the problems are known and are solvable, that they point to forestry as essential, that their correction may require legislation and may become political issues, that they must be attacked vigorously but intelligently, and that foresters must join in and assume definite responsibility and leadership.

THE present economic crisis has affected the forestry undertaking to an extent and in ways that cannot now be measured. It has forced to the front many problems which concern all forestry interests in common and which demand with great urgency the initiation of steps toward their solution. The circumstances of the economic depression have cast new light on many of our larger problems in forestry, giving strength to the basic principles which we have advocated but in some cases calling for a reinterpretation of them in application to conditions now revealed.

The crisis in the forest industries occupies a central place among the pressing problems of the day, touching as it does, directly or indirectly, the interests and activities of nearly every branch of forestry. The situation in the forest industries has its analogies in previous recessions which have resulted in large over-production with its train of industrial and social consequences. The situation has assumed the proportions of a crisis, because of the world-wide depression, the

collapse of consuming power here and abroad, the accumulated forces pressing for the liquidation of timber, new factors of competition, and exceptional difficulties of finance.

I do not need to describe the existing industrial situation as it concerns forestry. During the past few years it has been discussed widely, and with a great deal of candor on the part of the industries themselves. Little difference of opinion exists regarding the seriousness of the situation or regarding the consequences to industry and to the public. Nor is there question that in character and magnitude the problem has come to have national significance. While there is unanimity of opinion on these points, there are material differences in the interpretation of the factors leading to the crisis, and particularly with respect to the manner and extent of such action as it may be appropriate for the public to take toward ameliorating the present difficulties and toward the prevention in the future of recurrent crises of the same kind.

One must recognize that any critical

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

economic and industrial situation is the resultant of many factors and forces, often complex in character and difficult fully to appraise. It seems to me that one of the most important of the fundamental factors bearing on the present situation is the character of ownership of the forests of the country. It is a point of weakness in the foundation of our industrial structure and constitutes one of the greatest obstacles in building a sound system of forestry. It is a primary element in the instability of production, in unrestrained and often unintelligent competition, in uneconomic development of timber in given localities, in retarding uniform practices and procedures in the industry, and in enhancing the difficulties of protection and forestry practice.

The outstanding fact is that the timber of the country is owned by hundreds of thousands of proprietors, and that a very large part of it is under heavy pressure for liquidation. Widespread ownership in small units was a cardinal principle of the government in distributing the public land. Individuals and companies acquired their forest properties during a period of rapid industrial expansion and increasing demand for lumber, and under circumstances calculated to encourage speculation. It was inevitable that sooner or later all the owners should endeavor to realize on their property, by sale or operation of the timber. Rapid expansion of producing plant and frequent overcapitalization of timberland came in natural sequence. Every year's accumulation of investment charges, taxes, and protection costs increased the pressure to enlarge production and to liquidate timber capital.

There have been no adequate controlling influences at the source, no correlation of development of properties of different owners, no means of relating production to consumption, no effective barriers to the flood of liquidation. For a time expanding markets may take care of

such a situation, but not for long. The torrent of production overtakes even normal industrial expansion and increased demands. But with shrinking demands due to industrial depression and to competition with substitutes and with foreign timber, a crisis or even a collapse in the forest industries is unavoidable. Hence it is that the leaders of industry have been seeking to discover some way to control production. At every turn, however, one encounters the weaknesses of our system of land ownership. The situation is aptly described as follows by Mr. Wilson Compton in his testimony to the Timber Conservation Board in 1931:

"During the past several years timber values have become stagnant or have declined. Timber investments no longer are carrying themselves. Accordingly, the vast reserve timber holdings have become a financial burden on the operating lumber industry. The total privately owned saw timber is equivalent to about 50 years' reserve of raw material at the present rate of timber cutting. Twenty years' supply on the basis of present taxing systems is all that a well-ordered lumber manufacturing enterprise can afford to carry. There is, accordingly, the equivalent of 30 years' timber reserve supply in private ownership which the lumber manufacturing enterprises can not afford to carry, and which financially can not carry itself. The competition of other materials and, in ordinary past times, the constant prospect of additional competition of government-owned timber have in effect made the possession of these surplus timber reserves an industry liability and not an industry asset. That this fact is unhappy to the industry, to conservationists and to the public does not change the fact itself.

"These properties, to be sure, are in ownerships of varying conditions of financial strength. There are thousands of small timber ownerships in the recesses of the western forests purchased a quarter century ago, sight unseen, by school teachers, preachers, merchants and little speculators, who have had no returns ex-

cept the annual right to pay taxes and who would gladly today accept any offer of purchase. Many such small properties have in fact been abandoned for taxes. On the other hand, there are many timber ownerships well located and in strong financial possession. But by and large, the excess timber reserves are seeking liquidation. Fifty years of timber reserves pressing for liquidation through a manufacturing industry which cannot carry more than 20 years' reserves tells its own story."²

Thus we have a great reservoir of timber that ought to serve the country's needs for many years and be the basis for support of the producing and distributing industries, but it is without control and constantly threatens to deluge the market far in advance of real needs and to work our industrial structure in the process. The industry frankly acknowledges that it is unable to carry the great reserves of timber now in its possession to the time when the raw material will be needed and might be developed in an orderly manner.

What is the significance of these facts from the standpoint of the forestry undertaking in which we are engaged? One may enumerate a number of types of economic and general public service that may be derived from our forest resources. Of outstanding importance is the fact that the forest furnishes the basis for a great variety of industrial activities, through which people are employed, communities and institutions built up, taxable wealth created, and a contribution made by the region, where the forests are located, to the organized economic and social structure of the state and nation. These services cannot be rendered if, through a weak and uneconomic type of ownership, there are periodic interruptions of employment, recessions in values, delinquency in tax support of public enterprises, and constant danger of collapse of individual

industries. Under such circumstances the communities dependent on the forest are built on a shell that may crack at almost any time.

If the industry is unable to carry the reserves of standing timber, what is the situation regarding cut-over land? It is well known that the aggregate area of cut-over land now tax delinquent runs into millions of acres. I share the anxiety of many persons that this process will extend very widely in the South and West. I look to see investments in cut-over land marked off in the next few years on a large scale and the areas abandoned because the owners cannot afford to pay the taxes and protection costs, let alone any investment charges that may adhere to them; or perhaps in some cases the owners may transfer them direct to the government or the states. This process of abandonment of the ownership of cut-over land has been going on for some time. It has been greatly accelerated by the economic crisis, with the prospect of further forced land abandonment on a scale heretofore unknown.

The serious feature of the tax-delinquent land problem is that most of the states are not prepared for it. In some cases the land reverts to the states, in some to the counties, and in some to the towns. For the most part there is no adequate authority or policy, no administrative machinery, and no funds, to handle a land problem of such magnitude as this promises to be. If a large amount of land becomes tax delinquent in a state which does not have a policy or adequate procedure to take care of it, there is danger that it will remain year after year without definite status and with no agencies or persons responsible for its protection and final disposition. If on the other hand the land is promptly taken over by the state

²Wilson Compton. Statement on behalf of the American lumber industry to the U. S. Timber Conservation Board. Washington, June 11, 1931.

and given a definite status, the public assumes a responsibility for its care; and, even if at first the state cannot afford to do much with it, there is at least the basis for building a public sentiment in favor of proper management. It appears to me that the large blocks of cut-over land that are likely to be forced back on the counties and states should be taken over for protection and management by the public. In most cases this action would have to be taken by the state, though some counties may be strong enough to assume the responsibility.

Thus we see the likelihood of a very large proportion of the present cut-over land in the timber states pass out of private hands. Does this mean that the lands now covered with mature timber will also be abandoned by the owners after cutting? In short, must we acknowledge that the industry is able to retain ownership of forest land only during the period of exploitation, and that then the public must in one way or another recapture it after the mature timber has been removed and the lands in most cases have been reduced to a poor condition for the restoration and future growth of the forest? The policy of the industry in acquiring and managing land has been one of liquidation and not one of permanent ownership. There has been abundant testimony that most lumber manufacturers are not interested in holding land for growing timber, regarding "reforestation" as a public function. Mr. Compton says that the industry has much more timber than it can afford to hold under present conditions. It begins to look as if industrial ownership is failing so far as cut-over lands are concerned and that it must have public assistance in carrying the so-called reserve timber supplies; and further that the ownership of even the timber land

which will be cut over in the next two decades is temporary, extending only through the period of liquidation. If this is really the case let the fact be fully recognized, for it is of momentous significance in building a permanent land use policy for the nation.

During the past year or so numerous proposals have been made by representatives of the forest industries and by foresters to promote greater industrial stability. Some of these concerns such matters as better organization of the industry, standardization of products, improvements in manufacture and merchandizing, and more effective associated effort in various ways. Other proposals call for public measures involving legislative or executive action by the states or the federal government.

The Timber Conservation Board concludes that "the present and prospective annual burden of taxation on mature standing timber is the most important single present factor forcing the sale and cutting of timber without due regard to the current market demand for forest products."³ Professor Fairchild does not concur in the statement as it stands, but would include other factors with an indication of their respective influence and with emphasis on the burden as a whole. The rather heated discussion over the manner of expressing the problem of forest taxation recalls the remark of Professor Hibbard in referring to a study of the various causes of tax delinquency on farm lands. His comment was that "if a pack horse is broken down by carrying a load consisting of three bags of wheat and two of corn, it hardly seems logical to attribute the catastrophe to one portion of the load rather than to the other, since both were responsible in proportion to their respective weights."⁴ This simile

³Report of Timber Conservation Board. In the *Forestry News Digest*. 1932.

⁴B. H. Hibbard. Taxation in relation to land utilization. In *Economic Policy for American Agriculture*. University of Chicago Press. 1932.

may be applied to the problem of carrying timber land, except that no mention was made of the fact that the pack horse had a weak back and was not able to carry much of a load anyhow. The weakness in this case is due to the character of ownership of the timber land.

I do not think that any of us fail to realize the urgency of the problem of forest taxation. It cannot, however, be separated from the problem of taxation of agricultural and other classes of land, and must be considered in connection with other sources of revenue in the rural communities, public expenditures, and a series of other matters related to public finance. In the current discussions of the farm situation and of the efforts toward the development of a national agricultural policy, land taxation occupies a place of primary importance. I believe that we may be entering a period of very profound changes in the occupancy and use of land and its relation to public finance, that may have a far reaching influence on the forest problem. We should not delude ourselves or attempt to delude the public in the belief that a mere reduction of the annual burden of taxes on standing timber will have a material effect in preventing the pressure for liquidation, nor will a change in the tax system in itself induce timberland owners to hold cut-over land for future growth of timber. An unsound system of taxation is one of the obstacles to stability in land use, but it is only one and the correction of this difficulty does not reach the root of instability.

It is commonly said that one of the important causes of over-production is the competition from the sale of public timber. Last year I was delegated, as Chairman of the Committee on Public Forests, to study this question for the Timber Conservation Board. Taking the industrial situation of the country as a whole this

factor has been grossly exaggerated. So far as the sale of national forest timber is concerned, some large sales have been made in the last ten years that probably would not have been made if the present conditions could have been foreseen. During the last six or seven years especially there has been a deliberate policy of conservatism on the part of the Forest Service and many requests for sales involving new plants and large production have been denied. The effect of sales from the Indian Forests and from the revested Oregon and California and wagon road land grants in Oregon have certainly served as an unsettling factor in the local industry. Our recommendation to the Timber Conservation Board was: first, that the disposal of timber on the national forests be governed by a policy of extreme conservatism, in accordance with the principle that, while the public timber is available for industrial use the protection and advancement of the public interests shall be the controlling factor in its disposal and use; second, that the revested Oregon and California and wagon road grant lands in Oregon be added to the national forests or be brought under similar administration, this to be accomplished by appropriate amendment of the Act of June 9, 1916; and, third, that legislation be sought to organize the unallotted Indian Forests, wherever appropriate, in permanent forest reservations upon which the timber may be handled under long term plans of sustained yield.⁵

The policy of sales of timber on the national forests is an administrative matter. The attitude of the Forest Service is already one of conservatism. There is needed, however, support of this policy by the Administration, members of Congress, and the local public where the forests are located. The existence of the national forests, ably administered, is one of the

⁵Henry S. Graves. Report of the Committee on Public Forests to the U. S. Timber Conservation Board. November 14, 1931.

greatest elements of stability in the present situation. The status of the Indian lands and the Oregon and California and wagon road grant lands is different, for there is not the same element of central control of timber sales that exists in the national forests. To my regret the Timber Conservation Board failed to act on the recommendations relating to these two classes of nationally owned or controlled lands. I urge that the foresters take a leadership in promoting the needed legislation. In the case of the Indian lands it is a question of giving strong support to the policies urged by the Office of Indian Affairs. In the case of the proposed revision of the Act of June 9, 1916, there is likely to be opposition of the same type that prevented a proper solution of the problem of the revested lands in the first instance. A change such as I propose will require good judgment and wise leadership. But, in my opinion, the matter should not be allowed to drift, and it is a responsibility of the foresters to formulate the proposals for changes in the law and to lead in getting support for them.

Associated with the problem of conservatism in the sales of public timber and also with the problem of taxation, is the form of contribution by the federal government toward the support of the counties in which the national forests are situated. At the present time the government contributes 25 per cent of the gross receipts, derived from the national forests, to the states for the benefit of the counties where the receipts originate. This is in addition to moneys expended directly for roads and other improvements. This contribution is in lieu of taxes. The returns in a given county depend on the amount of business transacted by the government. If a large sale is under way there is, during its life, a considerable return to the county. In neighboring counties there may be very little return. Thus the contribution of the government to local

schools and roads is unevenly distributed and not certain or regular from year to year. Naturally there is great pressure in many localities for timber sales in order to bring in a new industry and to secure a larger contribution from the government toward local expenses. I ventured to propose to the Timber Conservation Board that the present system of federal contributions be revised, with a substitution therefore of a plan of systematic annual contributions to all the counties in which national forests are located, more nearly analogous to the taxation of private forest properties. There is ample precedent for such a plan in the policy of a number of states which return to the localities a regular annual tax from the state reservations.

In my opinion such a change as I propose would greatly strengthen the administration of the national forests. It is an appropriate time to consider the suggestion now, when the whole system of land taxation is under investigation. The national forests must do their part in the support of local communities. The contributions by the government now are very substantial, but not sufficiently well distributed and regular to be satisfactory in the long run. If large areas of land are taken over by the states through tax delinquency and are incorporated in public forest reserves, they doubtless should also bear their share in taxation. This is all in the interest of stability of policy in the various public forest properties and would insure a certain and regular contribution from them to the local cost of government.

Even with the adjustment of taxes and other features I have mentioned, the problem of instability of control and policy in the management of private timber-lands would not be reached. In some instances the merging of lands into stronger and more permanent units will doubtless take place, and should, in my opinion, be

given encouragement. Every acre of land that can be brought under a strong type of ownership is an element in stability. Mergers offer the opportunity for sustained management of the forests and the application of the best practices in utilization, maintenance of high standards of product, and economical methods of merchandising. There are, however, practical limitations to the extent of such mergers. Their influence on the major problems under discussion would be largely regional, as for example, in the North Pacific areas.

A further proposal relates to joint action by members of the manufacturing industry to control production. The ultimate objective is to stabilize price. At the present time the federal anti-trust laws stand in the way of agreements to control production. Without a change in law, companies would hesitate to enter upon such agreements and the banks would hesitate to make the needed loans, as long as there is the possibility of a federal suit at almost any time to dissolve the agreements. In other words public support is required to carry out this plan.

If legislation were sought in Congress to modify the anti-trust laws, the first question that would be asked is whether the proposed joint action by the members of the industry would be feasible in practice. It seems to me that control of production by an over-capitalized industry, particularly when this over-capitalization is due in considerable part to the ownership of more timber than the operator can carry, is impractical. Agreements might operate for a time, but sooner or later some individuals, especially those operating at high cost, would be forced to cut timber beyond the quota and to sell at prices below the standard, in order to meet special obligations which they have assumed. Such schemes are no novelty in the lumber business and all have invariably failed. This is without consideration of the existence of immense numbers of

timberland owners who could not be brought into the agreements. I personally think that the time has come for some modification of the anti-trust laws, as applied to basic natural resources, with of course such definite control by the Government as may be necessary to protect public interests. But I do not believe that such changes in law would result in meeting the basic difficulties of the present situation in the forest industries. Economic forces will break down any attempt at arbitrary quotas of production and efforts to peg prices.

Still another suggestion was set forth in the report of the Timber Conservation Board; namely, that "interstate compacts appear to afford practicable and desirable means of advancing the cause of timber conservation, controlling timber cutting and establishing and enforcing production quotas." I have already expressed my views regarding the effort to control production by enforcing arbitrary quotas. The proposal of the Timber Conservation Board appears, however, to reach further than that. It suggests the possibility of state control over timber cutting and making this a matter of interstate action where economic conditions require it. If the proposal involves the efforts to stabilize land management, and the application of the principle of local or regional sustained yield, selective logging or other woods practices, with a policy of liberal public coöperation, it touches the foundations of our economic problem and merits the most careful study.

It is gratifying that under the leadership of Mr. D. T. Mason and others on the Coast the principle of sustained yield management on private tracts has gained such favorable consideration. Sustained yield management is the essence of forestry; carrying with it the regulation of production in proper balance with growth and involving the necessity to provide for forest replacement. The introduction of

the principle represents the change from liquidation to systematic management of land for continued forest production. The progress in the use of methods of selective logging at points where it has heretofore been considered impossible holds out great promise. How far private owners can be induced to introduce the sustained yield system and how far, under prevailing conditions, the movement will serve as a factor in controlling premature production remains to be seen.

If we could assume that all the suggestions outlined in the foregoing could be put into effect, there still looms up the question whether private ownership can carry the great reserves of timber not now needed for operation. It is this thought that had led many persons to believe that some way must be found to bring a substantial portion of it under public ownership or control. One of the conclusions of the Timber Conservation Board is that: "The expansion of federal and state land acquisition, especially of timber lands now in private ownership which should be held in reserve for many years, is sound public policy." Some have gone so far as to urge that the federal government actually acquire large amounts of standing timber, issuing bonds for the purpose, if necessary. I wish that the federal government owned this timberland today. If it did, we would not be in the present quandary. But I am not prepared to endorse a plan of acquiring these lands by purchase. The government has already embarked on a policy of acquiring protection forests and a limited amount of land for timber production. The necessities of this program will probably involve between ten and fifteen million acres. This land has been largely cut over and the cost per acre is not high. The extension of federal acquisition to include a large

amount of mature timber is, in my judgment, out of the question. I believe that some way must be found for private ownership to handle the timber land in its possession. This may involve changes of ownership, drastic deflation of capital values, and perhaps large individual losses. But I cannot see the justification of the public taking over the burden of these timber reserves at the heavy charge on general taxation that inevitably would be involved.

Mr. E. T. Allen in the paper presented to the Timber Conservation Board in 1931 suggested three lines in which forest ownership could be strengthened: First, consolidation of ownership in larger and stronger units; second, reabsorption into public ownership, either absolute or on some partnership basis recognizing a retained private interest; and third, making money available, at less than commercial interest rates, to organize large-scale private management of desirable nature.⁶

The last mentioned plan has distinct possibilities in case of *bona fide* sustained yield undertakings. It is said that some applications already have been made or will be made to the Reconstruction Finance Corporation. Has Mr. Allen's suggestion of the possibility of bringing land under the aegis of the state or government in some form of partnership been fully canvassed? I venture to suggest the possibility of a form of auxiliary public forest composed of privately owned lands which the owners are unable to carry through long periods of time or cannot handle in ways essential in the protection of the interests of the state. A number of states already have a system of auxiliary public forests. For the most part these provide for the state sharing in the tax burden and requiring a proper handling of the forest. In the present case it might be

⁶E. T. Allen. Relation of Forest Ownership to Manufacturing Problems. Statement for the Timber Conservation Board. 1931.

possible to incorporate in auxiliary state forests areas which fall in the reserve-timber category and are beyond the power of private ownership to carry without public aid of some kind. The land and timber would remain in private ownership and the owners would continue to manage the property. The state would have an interest in the enterprise, on the one side through its contribution in sharing the tax-burden and providing other forms of aid, and on the other side in exercising a control over the time and manner of timber operations, in accordance with principles covered in the articles of agreement. There would be more likelihood of federal aid in protection and possibly in lending credit in an undertaking of quasi-state character than in purely private undertakings.

The foregoing is a rather cursory sketch of some of the problems which have been brought into prominence by the present economic crisis. The present situation gives new emphasis to the service that may be rendered to a region or locality through the existence of forests under stable ownership and control. It gives emphasis also to the industrial uncertainty and instability that accompany uncontrolled liquidation of timber resources. In our efforts to prevent the destruction or impairment of the productive values of forests, we sometimes create the impression that our objectives are attained if we succeed in securing forest renewal of good quantity and quality. It is equally important to maintain in each forest region enough timber capital to sustain on a permanent basis the local industrial activities connected with the harvesting and manufacture of forest products. We may call this regional sustained yield.

In New England the ratio of forest land to total area is greater than in any other economic region of the country, and the growth is increasing steadily under fire protection and progressively better

methods of forestry practice. But over a large part of the area the capital stock has been depleted to such an extent as to cause a rapid discontinuance of the local wood-using industries. The support of local communities through industrial forest activities is lost. Once the industries leave a region, it is always a difficult and slow process to restore them.

Some years ago a distinguished forester made the statement that we would not advance very far in the practice of forestry until the great surplus of standing virgin timber is greatly depleted. This may be true so long as there is uncontrolled liquidation such as exists today. It is important to the Nation as a whole that there be a continued supply of forest products for industrial and other use. It is vital to the well timbered states that there be retained enough timber to sustain the local industrial establishments continuously. This is one of the objectives underlying the state regulation of private forests in Sweden, which is directed both to the prevention of destructive practices in the forests which would impair productiveness, and also to a premature liquidation of standing timber that would lead to the reduction or discontinuance of local industrial activities.

The present situation in the forest industries and in forestry generally has been induced by unrestrained liquidation of timber. We are seeking some method of control of premature cutting of timber. Most of the proposals that have been made involve some action by the public. If all the suggestions for a remedy were carried out, the needs of industry and the public generally would still not be met. I believe that the idea of control of production will have to be carried still further and that this will be accomplished through restrictions by the public applied to timber land management, with a view to insuring a sustained yield in a region, in a locality, and where feasible on indi-

vidual properties. It would be expressed in such measures as would prevent premature removal of timber or growing trees which ought to be left standing in the woods. In the long run it is the principle of sustained yield that will furnish the key to stabilizing production. It will not be really effective, however, unless applied to all the forests in a

given economic region. In short some form of public control of private forests is likely to be brought about through the sheer necessity to stabilize industry and to assure the continuance of industrial activities in the several states or regions, as well as through the necessity to provide for national needs of products from the forest.



"Most foresters have concluded from their studies and experience that the United States ought to have a considerable fraction of its forest area—say from 20 to 40 per cent—in public ownership. I doubt whether this argument for public forestry makes any particular impression on the public mind. The great majority of Americans approach the question of how far public ownership should be carried from a quite different angle. They want the question settled on the basis of specific conditions and areas. Preferring private ownership, they place the burden of proof on public ownership. Instinctively they hold back from the idea of public ownership, except where a strong case can be made out for it. This is a sound position to take and suggests the angle of approach for foresters, at least for the present. To win acceptance our program should be formulated on the basis of encouraging private forestry wherever the private owner can be induced to engage in it. Present trends indicate that after every effort has been made to induce the private owner to apply forestry, there will remain a public responsibility far greater than public agencies will be prepared to redeem."

From *Forestry in a New Era*, by R. Y. Stuart, in this issue.

FORESTRY IN A NEW ERA¹

By R. Y. STUART

Chief Forester, U. S. Forest Service

The forestry profession has failed if its accomplishments were to be measured by the extent of private forestry instituted on private lands. However, in a span of 30 years it has changed the country from forest indifference to forest concern; from unorganized effort to nation-wide public forest policies; from practically no protection to protection of over 55 per cent of the Nation's forest land; from a narrow conception of forestry as tree culture to a realization of its import as a momentous land-economic problem; from a dearth of scientific knowledge of forestry to highly organized, efficient forest research institutions; from a handful of pioneers to a large group of experienced, resourceful and competent foresters of unquestioned integrity. The present era presents new challenges—to effect the practice of forestry among private owners, and to work out the right use of lands suited only to forests, particularly those acres being abandoned because too poor for farms, and the cut-over lands dropped for taxes. Professor Mulford, whose comments on this paper follow it, believes that in this new era, the forester needs “a new, easily understood public declaration of faith, to become gradually a part of America's matter-of-course thinking.”

WERE the success of forestry in the United States to be measured by the extension of sound forest practice on privately-owned forest lands, or by the curtailment of degraded forest acreages, it would make a sorry showing. Were the success of foresters to be gauged by the acreage of privately-owned land under planned and successful forest management, their records would not be enviable. What then sustains forestry and foresters?

We learned in school that forestry is a science and an art. Experience has taught us that it is that, and more. It is a complex, vital economic, social, and political problem. Its field of concern is not alone forests, but the economic, social, and political aspects of forests and forest lands as well, in their effect upon man's livelihood, standards of living, and happiness. Forestry is more than trees. It encompasses soil, water, climatic, biological, and other influences. The expression of its realization is in productive forests and protected watersheds, well managed range for game and domestic stock, safeguarded outstanding scenic and recreational values,

and utilization of a complex of interlocked resources under coordinated plans to accomplish these results. Forestry is sustained order and good trusteeship in the forest.

I have no intention to become fanciful in thus treating of forestry. Far from it. In no science or art is plain common sense more called for. I simply wish to point out that forestry is still being appraised; that its full compass and import have not been spanned; and that accomplishment from it must be based upon and gauged by its broad moment and influence.

While admitting, therefore, that, narrowly conceived, forestry and foresters have demonstrated little of accomplishment in the forest compared with what remains to be done, I assert that the science, art, and profession of forestry are attaining a progressively higher plane in the solution of America's forest problem. In a span of thirty years we have brought the country from a state of forest indifference to one of forest concern; from completely unorganized forest effort to nation-wide provision for public forest

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

policies; from practically no forest protection to a protection coverage of 55 per cent of the Nation's forest land; from passivity toward public responsibilities and benefits in forestry to unchallenged recognition of those responsibilities and benefits; from a narrow conception of forestry as tree culture to a realization of its broad import as a momentous land economic problem; from a dearth of scientific knowledge of forestry to highly organized, efficient forest research units and educational institutions well equipped and competently manned; from a handful of professional pioneers to a substantial group of experienced, resourceful, and competent foresters of attainment and unquestioned integrity. Can it be that, with such accomplishments, forestry and foresters should be thought of as unsuccessful or as unequal to the growing task of meeting the Nation's forest problem?

The task is not merely one for those of us who are in public employ; it rests upon the whole profession. The profession of forestry is outstanding in its recognition of public responsibilities. Every true profession has responsibilities of a public character. For every lawyer the law must be more than a means of livelihood, or of gain, or of attaining distinction. He is a part of the machinery for the administration of justice. The legal profession as a whole has a collective responsibility. Medicine imposes upon the practitioners special responsibilities to humanity, and the profession of medicine collectively has a function and obligation of its own, in connection with the general welfare. As between our profession and such professions as law and medicine, the difference is not that we give recognition to special responsibilities and they do not. The difference is that with foresters, as a body, whether publicly or privately employed, the responsibility more intimately shapes our thought and action. Our fundamental concern is to have forestry fit

into the place that belongs to it, in the national scheme of sound land use.

Private ownership of land, private development of the great national resources, and private conduct of every kind of business undertakings have been deeply grounded in our American spirit, traditions, institutions. As a Nation we distrust the capacity of government to do things efficiently, discriminatingly, and far-sightedly. We want independence for the individual and a free scope for private initiative and energy. And so for a long time our public policy, national and state, had as a basic principle the private ownership of all sorts of land. How it should get into private ownership seemed much less important than to get it there, so that it might be put to use. It was assumed that, once title to it had passed from the public, individual self-interest and the play of economic forces would assure its best use, in the long run.

The first breakdown of this principle came when the West grew solicitous about its water supplies. Individual self-interest found no account whatever in maintaining forests or other vegetative cover for the benefit of distant water users. Private use of the public domain range lands did not have to wait on their acquisition. They were open to all, as public commons. To the government the public domain was just land waiting for an owner, not resources needing to be conserved, still less managed. But to the people of the West they were much more than just land; and the prospective arrival of a private owner afforded them no promise of relief from their concern. The national-forest policy was primarily due to the anxiety of the West about water. But for that, it certainly would not have come about when it did. The West was preponderantly convinced, in spite of its strong preference for American individualism, that to obtain the best use of its mountain lands where diverse and conflicting interests

were involved, the principle of private ownership was not enough, because it would not universally work out to a satisfactory result.

We of the Forest Service should never forget this fact—that what moved the West to support the national-forest policy was, first of all, desire for water conservation. We have not always remembered the order of words in Secretary Wilson's letter of instructions to us on the day that we took charge of the forests, bidding us see to it that "the *water*, wood, and forage" are conserved and wisely used.

We Americans do not choose to make sweeping changes merely to carry out a principle. Nearly sixty years ago Carl Schurz, as Secretary of the Interior, proposed a new principle for the timberlands of the public domain—the principle of permanent public ownership and administration, in place of reliance upon private ownership to bring about their most satisfactory use. The American Nation was not ready for it.

In matters of public policy we much prefer to go a step at a time and to be circumspect about taking the first step. We lean to conservatism, not revolution. And so when, in 1891, Congress finally decided to do something about the public domain timberlands, it made no attempt to apply a principle; it did not even prescribe that anything at all be done; it merely bestowed permissive authority upon the President to set aside forest reservations. And to this day, the principle that all the public domain timberlands still remaining in Federal ownership should be held and put under national forest administration has never been carried all the way through. What was done initially was to pass the buck by giving permission for a small-scale try-out.

The law of 1891 did not restrict the authority of the President in the matter

of how far he should go, but when Cleveland used the authority, near the close of his second term, to increase from around 20,000,000 to around 40,000,000 acres the sum total of the reservations, Congress barely missed abolishing the whole experiment before it had had any try-out at all. For the try-out did not begin until after the law of 1897 authorizing administration and regulated use of the forest resources was passed. When Roosevelt a few years later, with the West still doubtful whether the experiment was going to work out successfully, used his authority to the full, Congress called a halt. First in six states, and later in two more, it took away from the President all power to go further. Gifford Pinchot and Theodore Roosevelt together had the daring, and fortunately together had the power, to convert what undoubtedly, had it not been for them, would have remained a relatively small-scale experiment in federal policy into a gigantic experiment. But its very size made it vulnerable. It had to show results quickly, or be thrown into the discard. The West would not have been willing to stand aside and wait for thirty or forty years to have determined whether in the long run public ownership and administration would be more beneficial than private resource ownership.

What happened was little short of a miracle. We ran a race against time, and won. It can not be said that the national forest enterprise was thoroughly established in public confidence and approval until well after 1920. During President Harding's administration there was a real showdown. Nor is the enterprise secure, past all danger, even now. Its continuance is being fought for, and will have to be fought for, in one way or another, many more times. But we have the public with us, and we shall continue to have the public with us, provided we do not lose its confidence through incompetence—

incompetence to conduct a difficult, exacting national enterprise with a high degree of devotion, integrity, vision, and skill.

The marvelous constructive work of organization which devised and installed a suitable machinery of administration, selected and trained its personnel, and laid down sound, farsighted basic policies which have stood the test of the years, was of course the work of a single man—Gifford Pinchot. But I do not think even he could have built up the organization of the Forest Service without the help of great good fortune as well as of his own genius. It could not have been done without the help of the Civil Service law and the development of its application, which by 1905 had reached a point that provided a safeguard for the nascent enterprise against political racketeering. It could hardly have been done anywhere else in the federal establishment than in the Department of Agriculture. It could not have been done there without the free hand and the intelligent, consistent support all along the line given Pinchot by Secretary James Wilson. I doubt if it could have been done at any other time in the history of the Department, then still young, relatively small, and unc centralized. But after allowing for all these things, the story is not complete. Men and circumstance in happy combination gave the enterprise the chance to succeed. From that point on, it was up to the profession of forestry. Could the profession rise to the responsibility, and seize the opportunity to make good?

The profession—including no less fully the men who learned on the job than those who came from the schools—can well be proud of the system of national forest administration and of the point which it has now reached. The road traveled has been long. Many obstacles have been surmounted, hard battles have been fought and won. What has been accomplished will avail, however, only

as it tends to greater service, because new tasks are to be undertaken and a new set of conditions is to be reckoned with, no less challenging to us professionally, than those confronted when our work began.

Most foresters have concluded from their studies and experience that the United States ought to have a considerable fraction of its forest area—say from 20 to 40 per cent—in public ownership. I doubt whether this argument for public forestry makes any particular impression on the public mind. The great majority of Americans approach the question of how far public ownership should be carried from a quite different angle. They want the question settled on the basis of specific conditions and areas. Preferring private ownership, they place the burden of proof on public ownership. Instinctively they hold back from the idea of public ownership, except where a strong case can be made out for it. This is a sound position to take and suggests the angle of approach for foresters, at least for the present. To win acceptance our program should be formulated on the basis of encouraging private forestry wherever the private owner can be induced to engage in it. Present trends indicate that after every effort has been made to induce the private owner to apply forestry, there will remain a public responsibility far greater than public agencies will be prepared to redeem.

The new era emphasizes the need for solidarity in the profession of forestry. Whether in public employ or in private practice, we are working out the solution of a public problem of vital importance—to bring about the right use of the vast land area in the United States which can only be used for forest purposes. We should not allow ourselves to lose sight of this as the fundamental problem, while we are engaged in such necessary but auxiliary inquiries as just how much wood we shall need, or the precise weight

to be given the various forest influences, or how to bring about healthier conditions in the lumber industry. The most difficult part of the problem at present concerns not publicly owned forest lands but privately owned lands acquired because of the value or expected value of the grown timber on them, but which, unless the private owner can be shown he can afford to grow more timber on, will come back into public ownership—in fact is already coming back, at an appalling rate. The forester also has the responsibility, but recently thrust upon him, of planning for the large amount of land which the agricultural requirements of the country and the quality of the land will not permit to remain in use for growing agricultural crops. Just as our profession at its beginning in this country had to undertake the then gigantic task of making forestry administration a practical success on the huge area of the western national forests, so now the profession, grown mature, must determine the future condition and form of use of the 396,000,000 acres of forest land now in private hands, and of the unknown millions of acres more of land which agriculture is going to give up.

It was but a few years ago that the Forest Service believed the inauguration of private forest management on an extensive scale was on the verge of realization in this western country, and threw the weight of its example and influence behind the movement. But the pressure of economic forces and the disinclination of private enterprise to undertake continuous forest production was too great. The belief proved insufficiently grounded. Essentially, the problem has remained the same.

We face a very different problem from that of making national forest administration a practical success in forestry. In that case the principle of private land ownership was to be departed from through

reserving from disposal areas where it was believed public administration might bring about greater benefits. It was not a question of finding a use for land which no private owner would wish to acquire. It was rather the regulation of use along lines that would realize maximum returns in public benefits of all kinds—a problem of coördination, plus the application of adequate technical knowledge and skill in the handling of each resource, to make the most of it. What is now before us is to give productive value to land which the private owner is preparing to abandon, or likely to abandon, because he can see no probability that holding it will be worth while; of land that has become a private liability, and which if abandoned to the public may be a public liability; which further is in the nature of a community liability whether privately owned or abandoned to public ownership.

The only possible owner of land for which there is no profitable form of use is the public. No one will permanently hold and pay taxes on land that has no present or prospective value. Our American assumption has been that, as the Nation grew, private initiative would find ways to make land profitable. It has not reckoned with the possibility that private enterprise might operate to rob the land of its usefulness and then abandon it, worthless, to the public again. Neither has it reckoned with the possibility that declining requirements for land use might become a cause of extensive land abandonment. Now, with contracting agricultural requirements for land and with a rapidly increasing accumulation of cut-over forest lands that, in their present condition, offer little incentive to continued private holding, we are faced with a very disconcerting prospect. Very large compulsory increases of public holdings through tax delinquency and title forfeiture seem inescapable.

Some states are meeting the situation

forehandedly. Pennsylvania's approximately 1,600,000 acres of state forests are made up in large part of tax-sale lands bid in by the state for permanent ownership and administration. New York inaugurated a policy of reservation and administration of tax-reverted lands in the Adirondacks as a state forest preserve about 50 years ago, and is now entering upon the purchase of lands which agriculture cannot make pay, to bring them back to productiveness through reforestation. Michigan makes all tax-reverted lands available for extending her system of state forests, in the discretion of the State Conservation Department, and has reserved nearly 800,000 acres of these lands for permanent state ownership. Wisconsin encourages the establishment of county forests through the retention of tax forfeited lands, title to which in that state passes to the county. And so on. But while wealthy states like New York and Pennsylvania are financially strong enough to handle their land use problems by themselves, it is a question whether

the Lake States will be able to do so, and for most of the Southern States the burden may be wholly beyond their strength to carry. In spite of the tremendous help afforded all the western states by the national forest system, some at least face land-use problems which are certain to impose a heavy strain on them.

Here lies the new challenge to the profession of forestry, and its second great opportunity. It calls for the best that we can give, unitedly. The task is twofold. Part of it is to discover and demonstrate all the possibilities of forestry as a means of inducing private owners to hold and employ land for timber growing, and to give all possible encouragement to the practice of private forestry. Part of it is to discover and make clear the measures necessary, in the public interest, to meet the conditions created as and where private ownership breaks down. No profession has ever faced a greater challenge and opportunity for enlarged public service. Forestry and foresters have entered a new era.

COMMENTS¹

By WALTER MULFORD

Professor of Forestry, University of California

LABOR declares boldly and clearly for what it sincerely believes should be national policy—the thirty-hour week. Business declares for what it sincerely believes should be national policy—less government in business. This is even more bold than labor's stand, at this period in the development of the world's thinking and the world's impulsiveness, when insistence on freedom from governmental control is so likely to lead either to anarchy or straight to complete governmental control of everything, through

Communism akin to that of the Soviet republics, or through Fascism akin to Mussolini's. With the spectacle of two such completely bureaucratic national reactions before us, one would think that American business could hardly have chosen a more dangerous time at which to try to break down the strength of government and the respect for government, even though successfully camouflaged for the moment under the necessary move for economy. Labor and business have spoken. So have the voters of

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America. They, too, want new policies. They don't know what, but they must be different and promising.

In fields in which the workers do not know what they want, or in which effective captains backed by followers enthusiastically devoted to the campaign, are lacking, there is in this crisis stagnation or helpless bewilderment. In fields in which leadership is able, powerfully aggressive, and abundantly upheld by the workers, these are the times in which results are attainable with a speed unknown when drifting on placid waters. In the crucible of a period such as this, of semi-chaos, defeatism and testing, is the time of times to formulate more advanced objectives and to travel toward their attainment.

Heartily I agree with Major Stuart that the forester now faces greater challenge and larger opportunity. Wisely he points the way to two immediate undertakings of the first magnitude—private forestry and the secondary public domain, composed of tax delinquent lands. There are other major responsibilities. And through the years still others, not now foreseen, will continue to arise. May the new era in forestry be ever-changing, ever-stimulating. How dull merely to cut the cloth if every pattern were clearly laid down for us.

And how fortunate we are. A profession called forestry has a part to play in the life of a nation. A great nation. Great in wealth despite faulty distribution resulting from unprecedented changes in production economics. Great in traditions despite the shadows. Great in ideals despite the stumbling. Great in average sound judgment in the long run, despite the erratic runnings hither and yon after will-o-the-wisps. Great in finally demanding, and in finally achieving what is demanded, when once thoroughly aroused to a need. Frills will now be diminished or discarded in governmental matters.

Fundamentals will be increasingly emphasized.

Such is the nation that is rather rapidly becoming keenly aware that forests are fundamental to satisfactory national existence. Managed forests. Managed by men trained for the purpose. Many, many thousands of them. Not "tax-eaters." Wealth-producers. Several kinds of wealth, including some among the highest and best.

Of course, man will continue to want wood in large amounts, even after the maximum development of substitutes. The possession of wood and of many other products derived from the forest will continue to help materially in making man's life comfortable. Of course forests are wanted to assist in minimizing the shifting of soil; and under some conditions, to improve the distribution of waterflow. Of course, we want non-tilled lands made inviting, as refuges now from strain and turmoil, and in the future to provide one of the safe outlets for the increased leisure which is to be man's portion—the forest thus contributing strongly under both conditions to moral balance, mental sanity and national stamina. Ours to take a part in keeping the earth beautiful, comfortable, habitable; and man himself wholesome and effective; all through keeping the earth properly clothed.

Our profession covers so complex a field that, since each of us must work in his own more or less detached niche, we readily become confused as to main issues. Is it not helpful in keeping ourselves oriented in our ever-new forestry if we occasionally remind ourselves of basic principles? Here are a few.

Forestry is essentially a national problem, to be worked out primarily on the basis of national welfare. Responsibility centers on the national government. By no means does this preclude other types of forest enterprise. Industrial forestry is preferable wherever practicable. Town

and county forestry will sometimes meet the need admirably. State forestry is highly important and should be self-governing wherever the state can function adequately. But it is federal responsibility to see to it that someone puts all important forest areas under effective management. And it is probable that the great majority of the extensive forest tracts of the United States will ultimately be federally owned, and managed from the standpoint of national need. If it is to have the chief responsibility, the federal government must be given also the necessary power. I would like to see it made legally possible, under proper restrictions to prevent injustice, for the federal government to take over state or private forests, just as with lands for the army and navy, when necessary for national welfare. We propose to continue to be a nation, not a collection of self-seeking states.

A second principle requiring emphasis at this time is coöperation. Why delay to debate further whether or not the lumberman or his predecessor employed unscrupulous methods? Certainly he is no longer in an enviable position. The welfare of the lumber industry is one of the indispensable foundations for the success of forestry. The industry has never yet arrived at continuity of purpose. It is now in a desperate condition, and in a receptive mood. It needs all available, competent assistance. It is hoped that from this point forward the lumberman will not merely tolerate the forester as a nuisance, or ridicule him as a theorist, or oppose him as an enemy. Why stop longer to bewail the fact that too often the forester has been unfriendly to the lumberman, unsympathetic with his problems, and only wretchedly equipped with the facts and the technical skill which any business has a right to demand from a supporting profession? It is high time for forester and lumberman to work with

a common purpose, in closest friendship, with mutual respect, together finding the way along the new and difficult trail. Coöperation, not conflict, should dominate in the new era.

One more principle: we need permanently the strength of all the elements of national society most directly concerned with the forest. Foresters alone are a tiny group, among one hundred and twenty million people. No forest policy developed and promulgated by one of their committees working alone can ever attain the purpose completely. No forest policy proclaimed by any lumbermen's association or by any governmental agency working alone can ever attain full measure of success. In the far-reaching field of forestry, the goal cannot be reached by any committee or organization which, justly or unjustly, can be accused of working for its own specialized interest; or which approaches the problem from only a few of its angles. No committee or board can do a complete job when it is able to give to so complex a project only the odds and ends of time from lives much absorbed in other affairs. The policy committee of the Society of American Foresters, the Western Pine Association and the United States Timber Conservation Board are all to be congratulated, and their earnest work is worthy of real gratitude. Each has accomplished a step forward. But if a forest policy is to have the devoted support of all major groups concerned, each should have had a hand in preparing it. Also, we need a more completely rounded and more definite program, based on the combined judgment of all parties primarily interested. No proposed policy has satisfactorily determined the proper relation between federal and state forests; or between federal forests and federal parks. No one has yet spoken with authority based on the fullest consideration of the facts, as to what precisely should be the tax contribution from

publicly-owned forests. Where is the complete schedule which will make industrial forestry a reality far and wide? Who knows precisely how to grapple with the secondary public domain? These are random examples of many matters awaiting solution.

We need the strength of other groups *permanently*. Broad general policies can be determined which, if wisely conceived, should endure. But no forest policy can be permanent in important details. There are constantly changing conditions, requiring that forest policy be elastic, responsive. There must be continuing, expert vigilance if forestry is to be kept in step and thoroughly alive. Occasional spurts of reorientation are not the best answer. Furthermore, a permanent advisory group, viewing the situation from the standpoint of the nation as a whole, could be the greatest possible stimulus and bring maximum public support to all types of forestry, governmental and private. Such a group should be a powerful balance wheel in times of stress in the every-new forestry.

The American Forest Council should be established. It should be entirely disassociated from government. It should involve no expense to the taxpayer. It should be permanent. We have in the United States several altruistic Foundations, broadly conceived and wisely administered for the maintenance of man's welfare. Furthermore, we shall continue to have men anxious to find a way in which their accumulated wealth can produce a sustained yield of public service. Through one or the other channel it should be possible to endow a Council which has so altruistic an objective as the development and coördination of American forest policies.

No member of any government service should be on the Council. This would give added strength to government for-

estry. Probably there should be only one forester on it. It should include able men thoroughly conversant with the lumber industry, recreation, agriculture, the live-stock industry, water interests, and the point of view of the general public. However, each should represent, not his industry, but national welfare. The term of office should be not less than seven years, with only one or two members retiring in any one year. It should be made a real job by the members of the Council themselves, not by delegating the essential work to assistants. Arrangements, by salaries and otherwise, should be such that members give a considerable part of their time to the work. There should be no ex-officio members. Let each man be chosen because of fitness for the task rather than because he is well qualified to hold a certain position of leadership elsewhere. The Council should have advisory power only, but its findings should carry such weight with the American public as to make resulting action almost certain.

Labor has spoken for the thirty-hour week; business, for less government in business. The forester, too, needs a new, easily understood public declaration of faith, to become gradually a part of America's matter-of-course thinking. Perhaps something along this line:

The forest is a public utility. It yields values both to the owner and the public. When private ownership will properly protect both classes of values, it is the preferable policy. When private ownership does not accomplish both purposes, public management must become effective. By one agency or the other, all the reasonably productive large tracts of forest land in the United States, and all the extensive areas on which a protective cover over the soil is of economic importance, must be put under definite forest management. To do so is essential to national safety.

DISCUSSION

Raphael Zon: I am just seeking information. In the face of the collapse of private forestry, at least in our region, I wonder if Professor Mulford has some real evidence of its success.

Mulford: I am glad that brother Raphael brings up that point. I don't ask anyone else to agree with me, but I happen to be one of those who believe that business enterprises should be left in private hands whenever they can be conducted by private owners with justice to the public. I believe in healthy competition between private owners and government forestry such as prevails in Sweden. I still have strong faith that when we find the way, through many methods worked out in recent years, and others still to be developed, that in some parts of the United States it will still be possible financially to have industrial forestry. It has broken down. Yes. I wonder if Raphael can tell us of anything else that hasn't broken down in recent years. It may not come back; it is possible, I admit it, that industrial forestry can not succeed. Even in that case I would feel that it were preferable could it have succeeded. If it does not succeed, the best way in my judgment to get public support for wide-spread government ownership is first of all to come out and do everything we can to make private forestry possible. However, I am supposed to lead a discussion. I know there are a lot of men in this room who don't agree with some of the things that I have said. Let's hear from them. I know there are men in this room whose faith has been wavering. Please get up and tell us why. We won't argue with you. Tell us what is the matter.

Chairman Guthrie: I can see several in the audience who are engaged in the practice of private forestry—Swift Berry, Dave Mason, John Woods. Can we not hear from some of them?

Zon: Maybe private foresters have the faith but not the evidence.

Swift Berry: I didn't come prepared to discuss the papers that have been read. Naturally I don't take quite the view towards industrial forestry or land management by the private owners that has been expressed. I don't know whether it has failed as much as has been expressed. At the present time it is pretty hard for the owner of private land to see where he is going to get much return on his investment in cut-over lands, or standing timber. Most of them are going ahead and holding their cut-over lands. I haven't seen many figures advanced regarding the present status of public forest activities. I don't know how much return there has been for the investment that has been put into public forest activities. There hasn't been much cutting on public lands.

In the matter of protection I don't know whether the public land record is much better than on private lands. I would want to see the figures before I would admit there has been greater failure on private than on public lands. A good many areas of private cut-over lands are in fairly good shape, are being protected and have good young growth on them. I couldn't say myself whether or not there will be a return on this investment. It may have to be taken over by public agencies. If so, they will be in better shape when it comes time to take them over.

With reference to our own tracts, we feel we have enough timber to last 40 or 50 years and by that time some young timber on cut-over lands can be manufactured. Whether we can afford to hold it and do that I don't know—I mean in private ownership. But here is a tract in private ownership which can be managed on a sustained yield basis and our present cutting operations are probably less than a sustained yield basis.

In listening to one of the papers this morning it struck me, speaking of unregulated exploitation of timber on private lands, that it isn't always virgin timber. In the Southeast and also in California foothill lands, cutting is going on in second growth, such as for mining timber; and that is injuring second growth stands which should be managed in some way, acquired by the state or in some way taken care of. They are turning out a very low grade of lumber.

My attitude toward the relation between public forest activities and private ownership is that the public should take the lead largely in an educational way. They should find out and make available to owners what can be done. There should be a commission, either state or national, such as Professor Mulford suggests, that should determine which land should be maintained as producing forest land and which as protection land, brushland, woodland, etc. Then this agency or some other agency should determine what is necessary or advisable to maintain those lands in proper condition and what regulation should be applied. If the ownership is unable to carry out the recommendations, then the public should have the opportunity to decide whether it wants to step in and acquire those lands.

E. C. M. Richards: He has told us, I think, that he has 40 or 50 years more to go. In other words he has not sustained Prof. Mulford's contention that private forestry is actually going on now.

Mulford: I strenuously object. Did I say that successful private forestry is now going on? If so, I apologize.

Zon: I get it you are for industrial forestry.

Mulford: Yes, I prefer it.

D. T. Mason: I didn't speak when you called on me because I felt that this was a discussion of federal responsibility at this hour rather than of private forestry. I don't intend to discuss private forestry

at this time because that is one of the subjects to be taken up tomorrow. I think what Professor Mulford had in mind was to suggest the public responsibility for removing such obstacles as the public is responsible for. I think it appropriate at this time in connection with what Mr. Zon has said to suggest the public responsibility for removing economic obstacles in the way of private forestry. Until those obstacles are reasonably well removed it is not fair to find fault with the lack of progress of private forestry. I simply want to call attention to the responsibility of the public for removing those obstacles.

E. F. McCarthy (New York State College of Forestry): There are one or two things you all know and Zon knows. Private forestry is successful where it has growing stock and where it has a market. It so happens that in this country you have the growing stock where you don't have the market. In the East we have the market, but we don't have the growing stock. The question of how to get growing stock in the East goes back to the question of who will own it. Eastern owners are small owners. One primary purpose of forestry is to keep the small man on the farm by enabling him to build his buildings and fences again, and thus enable him to carry on agriculture, if not as a business, at least as a living. The small farmers in the East are coming through this thing without begging. They are going to be able to stay on the farms as long as their buildings and fences hold together. When they are gone it will be difficult to put them back if they have to pay the high prices which they will have to pay if the lumber must come from the Pacific Coast, because their own structural and saw timber is gone. It does not make much difference whether it is grown in the southern states or on the Pacific Coast; prices in the East will not be far apart and will be set by the large supply. The hope of the small farmers of the East

is to have timber on the farm. We are going to make a drive to get the small land owners to grow their own timber. The East isn't letting its growing stock come back. Our stands of a thousand board feet to the acre are only one-tenth of a crop. With a good market they would be cutting 2 x 4's from 6-inch trees. Meantime, in spite of it, our growing stock is picking up. I don't know how we will manage it in the East. I hope the private owners will take hold. The counties are taking hold in New York State.

We even have some town forests and some state forests. Personally, I am with Mulford. If the private man will do it I would like to see him do it. We will use forests for recreation, but the foresters should keep in mind that the primary purpose of forests is the production of timber. We want to keep the small farmer on the farm. We want to put men back on the farm. In either case the farmer must have something to build his buildings and fences out of, and the price must not be too high.



"Of outstanding importance is the fact that the forest furnishes the basis for a great variety of industrial activities, through which people are employed, communities and institutions built up, taxable wealth created, and a contribution made by the region, where the forests are located, to the organized economic and social structure of the state and nation. These services cannot be rendered if, through a weak and uneconomic type of ownership, there are periodic interruptions of employment, recessions in value, delinquency in tax support of public enterprises, and constant danger of collapse of individual industries. Under such circumstances the communities dependent on the forests are built on a shell that may crack at almost any time."

From *Some Critical Issues in Forestry*, by H. S. Graves, in this issue.

THE PRINCIPLES OF CONSERVATION IN THE USE OF WILD LANDS¹

By S. B. SHOW

Regional Forester, U. S. Forest Service, San Francisco, Calif.

One third of the total area of the United States, or 614,000,000 acres, is useful only for forest purposes, with the likelihood of an additional area of 80,000,000 acres being added for reforestation by 1950 because of the abandonment of worn-out farmland. Forestry is being practiced on 12,000,000 acres of the private commercial forest land, and on 93,000,000 acres of that owned by the public! Soil changes made in the process of exploiting wild lands are almost wholly in the direction of deterioration. More effort must be devoted to creating rather than merely harvesting crops of timber, forage and water.

THE Institute of Land Economics under Dr. Richard Ely, used to have as its motto the phrase "Under all, the land." It is worth while for foresters to forget for a moment the various crops with which they deal—wood, water, forage, wild life, recreational use—and think in terms of the land, the soil, which is the source of all the crops. Agriculture in this country is finding more and more that too great preoccupation with the technique of crop production and the dollars and cents economics of farming has led to practises of land treatment finally destructive to the soil and to agriculture. The forest and range lands are to a very large extent suffering from a similar intentness on immediate financial considerations, and on production of individual crops.

We commonly designate as "conservation," sets of practises which maintain and renew the renewable resources of timber, water, forage, wild life and farm crops. We designate as "mining," sets of practises which fail to renew such crops or make their regrowth impossible. Both the farm lands and the forest lands of the Nation have been mined extensively. This can be said without elaborate statistical proof and without any implication of censoring individuals or groups. Soil and resource mining was the pioneer way to quick wealth.

Although a lot of the original forest land has been put to other uses, much of it has forest values and uses, or nothing. What is the area of forest land on which the practises of forestry can, might or should be applied? For the Nation as a whole 495,000,000 acres are classed as commercial forest land, that is, land bearing or capable of bearing a stand susceptible of commercial use for wood. An additional 119,000,000 acres is classed as non-commercial. Some of this is withdrawn for park purposes, the rest carries a light open stand of trees, not calculated to be logged. The total forest area is thus 614,000,000 acres, nearly one-third the total area (1,900,000,000 acres) of the United States. This great area has been so thoroughly picked over for agricultural land that in the main it must be regarded as useful for forest purposes only.

In fact, the agricultural experts insist that east of the Great Plains there are now 50,000,000 acres of cleared farm land available for forestry and that by 1950 this will have grown to 80,000,000 acres. Nearly all of this area was once forested and it seems likely to return to forest uses. Much of it is hill land, already ruined or being ruined for agriculture by erosion brought about through bad farming practises. The rest of it is submarginal in the economic sense of the word. If foresters accept this gift of the

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

poorest and worst depreciated agricultural lands, the total possible field for forestry mounts to 694,000,000 acres, well over one-third the Nation's area.

Since the only substantial progress in managing treeless grazing lands has been made by foresters, we might cautiously claim perhaps 300,000,000 acres of this class as a field for forestry. The possible field for the profession then totals some 994,000,000 acres or well over one-half the area of the country.

What values does this enormous area possess? Recent studies by the Forest Service indicate 365,000,000 acres with a high value for watershed protection; at least 50,000,000 acres for recreation alone or principally, and at least 150,000,000 acres for wild life as more than an incidental. The area needed to supply the wood needs of the Nation is variously estimated but will probably be not less than 300,000,000 acres. Domestic livestock is now grazed on about 400,000,000 acres. All these individual values and uses total far more than the total area available. Obviously, on many areas, two or more uses can be combined and will have to be combined if the full output of values and products is to be obtained. These estimates are certainly not exceedingly accurate but they do give the best picture now available of the total needs—in terms for forest land area — of the country. Quite evidently the practises of conservation will have to be applied to most, if not all, of the forest land area, unless the Nation is willing to forego the products and services which these lands have produced and are capable of producing.

We may ask the question "What is happening now on this vast area of wild land?" Again, a minutely accurate answer is impossible but a reasonably close approximation can be reached. Of the 495,000,000 acres of commercial forest land, 396,000,000 are privately owned, and conscious, deliberate forestry is now

practised on about 12,000,000 acres or 3 per cent. On the 100,000,000 acres of publicly owned commercial forest land, forestry is practised on about 93,000,000 acres or 93 per cent of the total. The accumulated effect of lack of forestry is emphasized by the fact that the current growth on the entire area is very much less than the current use. Or to put it another way, about 300,000,000 acres have to date been so closely logged that they are no longer classed as saw timber area, and one-fourth of this, or 75,000,000 acres, is entirely unproductive.

The figure for forestry practise on private lands is that derived by the Society of American Foresters. The figure may be higher or lower, depending on adoption of a standard differing from that used by the Society. But when you consider the 97,000,000 acres of commercial forest land on which there is no organized protection against fire, and the probably 20 to 50,000,000 acres already abandoned for taxes or in process of abandonment by the owners, it is certain that even the minimum requirements are a very long way from attainment on scores of millions of acres of private forest land. The basic job of adequate fire control has not been fully met on the vast majority of private areas where organized protection is attempted. The average area burned over annually is 11.8 times the agreed-upon allowable burn. By way of comparison, the objective has been attained on 65 out of 95 million acres of national forest land on which special protection is needed and for the national forests as a whole the actual burn is but 4 per cent above the allowable.

The current situation as to forest lands having watershed value is about as follows: Some 120,000,000 acres of the total of 365,000,000 are in various public forests with definite management plans and practises designed to protect watershed values. The remaining acreage in

private ownership includes a large area of eroding hill farmland, overgrazed woodlands attached to farms, besides the large area of forest land where sub standard fire control or heavy cutting practise does not take care of the watershed values. A large acreage of public domain in the West, and having watershed value is eroding seriously because of overgrazing. Apparently, at least, half of the watershed area is now treated so that the protection values are not being perpetuated.

The forest as a habitat for wild life requires the same methods of handling as for wood production and watershed protection, that is, protection against fire and preservation of a cover. Lack of organized fire control and persistent overgrazing are major factors in all parts of the nation in ruining or depreciating forests as a habitat for wild life and perhaps particularly for small game animals and birds.

The range lands in most regions have lost carrying capacity to a serious degree. Tens of millions of acres of western ranges produce not over one-third to one-fifth of the forage formerly carried, and very large areas are eroding seriously. On millions of the 125,000,000 acres of woodland attached to farms the remaining value to livestock is merely for shade, and overgrazing has not only destroyed forage values but has prevented forest reproduction, started processes of erosion and destroyed a former habitat for wild life.

Of the 994,000,000 acres of forest and range land, therefore, I do not see how it is possible to figure that much over one-third is now managed so as definitely to safeguard the soil. Certainly, it is impossible to assert that the job of conservation undertaken 30 years ago, is anywhere near complete.

Now, of course, all this is an old story. But its essential truth remains whether the particular estimates used are high or low. The degree of depreciation of commercial

forest lands is perhaps not much greater than that of lands used for agriculture and for the range lands. All of these major uses seem to have failed to about the same degree to follow the principles of conservation in land use.

In talking of soil conservation and land management and in attempting to appraise how much of the total job is now being done, it is essential to think of one thing at a time. Many men, in and out of the profession, become impatient at the very word "conservation" as here used because they assert that for many types of wild land and the crops thereof, it does not pay. Many of the owners of range lands in the California foot hills are wrecking their own property and bringing nearer the end of their own businesses by overgrazing. They do this because they assert it does not pay to do otherwise. Thousands of farmers of hill land in the Ohio basin and on the Piedmont Plateau and elsewhere have depreciated their properties, because it did not pay to terrace or to use the other practises which would keep the soil from moving down hill. Millions of acres of forest have been clear-cut because of the belief by the owners that it did not pay to log selectively.

It may be that every individual owner who has so argued was and is correct. But it does not then follow that any practise of land treatment which is thought to be immediately profitable is therefore conservation. It is a contradiction in terms. The dollars and cents of individual ownership are one thing and the conservation of land is another.

The problem of making a profit out of the use of land or its products is first of all one of economics—of man-made laws of money, interest rates and sale prices. Good soil conservation may or may not be immediately profitable from an individual owner's viewpoint—and there is nothing to do but accept this as a fact.

We would greatly improve the chance for straight thinking and unanimity of action if we could get firm hold of the fact that the nature of requirements of trees and grass are not readily changed by man, that the climate is not, but that the soil is. It is a pretty safe generalization that the soil changes made in the process of exploiting wild lands are almost wholly in the direction of deterioration. Sheet erosion which removes what the soil technicians call Horizon A or fires which burn the humus out have never been shown to improve the soil.

Actual soil conservation or land management must deal with and conform to the laws and facts of biology and the natural sciences generally. It deals with climate, soil and living plants and animals.

The first principle of conservation seems to me then that all practises must finally be judged as to goodness or badness by what they do to the soil. Methods of agriculture, methods of grazing, or methods of forest utilization which start erosion, for example, may, and often do, have impressive financial justification. But we ought to be able to recognize them as bad practise certain to lead to self-destruction. They can scarcely be called conservation.

Methods of recreational use which result in compacting the soil through excessive trampling may result from the desire of multitudes of people to see and enjoy the redwood or the big tree. But in final effect, such methods are as bad as more spectacular and rapid means of destroying vegetation.

So it seems to me the practising forester would do well to watch the dirt under his feet rather more than we have been doing. Many of the important changes in the soil brought about by man's acts are quite readily detected if one really watches for them. We may not always be able to prevent or arrest soil changes but by recognizing them we sure-

ly can detect bad silviculture, bad range and recreational management.

On the whole, readily detectable changes in the soil mean not only changes for the worse, but mean that the technical practise on the area is pretty likely to be bad. In this state, we used to have a lot of high-power, high-speed donkey logging, that gouged canals up and down the hills and commonly started erosive processes. It was unquestionably bad soil and forest conservation, even though it used to be supposed it was a necessary practise.

Here and elsewhere, we have had a good deal of burning of brushland in the effort to increase forage. Erosion is commonly found to follow such practises and accumulating evidence indicates that the wasting soil is inevitably followed in time by a wasting forage. Elaborate sample plots to follow the history of forests or forage are hardly necessary when the evidence of the eyes shows plainly that a particular practise leads to soil loss or deterioration.

A technique of silviculture and range management which does conserve the soil may not be the best in the sense of maximum crop production but, at least, it is not resulting in deterioration of the soil.

A second law of wide applicability is that processes of soil change, once started, are stopped only with difficulty and slowly if at all. The first stages of erosion, for example, on an overgrazed range, may not in themselves be serious. But once begun, erosion tends to accelerate and the growing momentum is more and more consequential and difficult to halt. Many of the national forest ranges, which 25 years ago had reached the eroding stage, have not yet been stabilized in spite of conservative stocking and use. Soil wasting and deterioration are readily started, but slowly stopped. Any practising forester who underestimates the potentialities of such processes because of small and unimpressive beginning, is likely to com-

mit a major blunder in land management. If we could judge all the technical practises of forestry by their merely visible effects on the soil, a great deal of serious trouble might be prevented.

It is small consolation that American agriculture has been painfully slow to relearn the axiomatic truth that soil wastage and deterioration is an unfailing sign of bad practises. A large part of the 50,000,000 acres of abandoned farms is testimony to the fact that others besides foresters have tried to beat the game of ignoring soil conditions.

A third principle which follows logically from the others is that a form of resource management which fails to conserve the soil must end by reducing the capacity of the soil to produce the resource. Agriculture has accumulated voluminous records of decreasing crop yields on hill farms as the soil washed away. Quite probably the waist-high grass of the western ranges which the pioneers love to talk about has vanished not so much directly through over-grazing as such as because of soil deterioration. In the case of forests, the effects of site deterioration is naturally slow to appear and difficult to measure. The burning out of humus from the sandy soils of the Lake States has, from all accounts, resulted in serious and widespread reduction in site quality. But our successors are likely to detect in many places a loss of growth capacity which today can only be surmised.

Of course, all of this insistence on looking first, last and all the time at the soil as well as the resource deals with a most simple and axiomatic fundamental of forestry. All of us have had to make compromises between the ideal and the practical. And the increasing pressure of the practical has unquestionably forced attention more and more to the bank book rather than to the very basis of the living things we work with. The exploitation of range, farm and forest land has to a very

high degree been concerned with skimming unearned values inherited without effort. Naturally, in the competitive struggle to turn accumulated resources into cash, most attention has had to be given to the so-called economic considerations.

But on any basis of figuring, the need is urgent for much more effort devoted to creating rather than merely harvesting crops of timber, forage and water. Practices and methods which in the pioneer stage might be acceptable, need re-examination and re-appraisal in the light of present day and future needs.

Certainly the profession has a place in the industrial and economic problems of helping the private owner of timber or range land in the financial success of his venture. But to say or imply, as has been done, that this is the whole of the land conservation problem is a patent absurdity.

I venture to believe one major reason the conservation movement has lost momentum is because of sharp differences within the profession and a failure to present the true magnitude of the wild land problem. These internal differences have been nowhere more pronounced than in a lack of frankness in appraising and stating the full size of the job yet to be done on several hundred million acres of forest land. The public has been alternately assured that existing practises are generally satisfactory in insuring stability of timber supply, permanence of the watershed cover and of forest ranges, or that if existing practises are injuring the land and resource it is of little consequence because there is too much anyway. Both of these can hardly be true. Another favorite formula has been an assertion that conservation is already practised quite fully but that public assistance is essential to protect the public values on wild lands. The demand for more and more public assistance by the industries' utilizing the products of wild lands has been and is

insistent, but generally fails to recognize and admit that the public has a real reason for concern in that many existing practises are in fact depreciating the land. An appeal for public assistance on the grounds of mere industrial aid could, it would seem, be greatly strengthened if based on a frank and realistic recognition of what the public is now losing and will lose.

Naturally, all these varying and contradictory platforms and representations serve in the final analysis to confuse the public and legislators and to nullify each other. It is, of course, a matter of history that a well organized and compact group can obtain a temporary advantage by special pleading, and insistence on its claims, but the ephemeral value of such victories is well enough illustrated by the current difficulties of all industries using wild lands.

There are, of course, divergent programs of public action advocated by different groups within the profession. But suggested programs which start with an under-statement of the full size of the soil conservation job yet to be done or which belittle the national importance of soil and resource wastage, or which fail to state in their true light the widespread consequences of many existing practises, or which claim that relatively minor changes will solve the whole problem, or which over-insist on immediate financial questions of particular groups, seem to me to weaken rather than strengthen the

chance to convince the public that our professional advice is to be accepted.

It ought to be possible to recognize and state the immediate problems of private ownership of wild lands while granting that many current practises are harmful to the soil and to the resources. A situation in which groups within the profession feel it necessary to admit nothing and demand much, necessarily creates its own antidote.

The full size of the wild land conservation job looms very large. I do not see how full public understanding and action can be expected from anything less than a frank and full statement of the problem both in its private and public aspects. We ought to agree on such a statement, not so much on the grounds of ethics or duty, as because it is the way to obtain effective and adequate action. And, to return to the theme of this paper, a restatement of the problem in terms of the wild land, and what is happening to it, rather than in terms of specific resources, or in terms of financial problems of groups using the resources, ought to be an effective way to get concerted action started.

Major Stuart's paper² spoke eloquently of the job ahead of the profession in working out constructive management for the lands now in private ownership from which private ownership is likely to withdraw. A unified position by the profession will be needed if we are to obtain the public recognition of this problem and public support to our efforts to solve it.

²In this issue.

PRINCIPLES OF CONSERVATION IN THE USE OF WILD LANDS¹

By R. H. RUTLEDGE

Regional Forester, U. S. Forest Service, Ogden, Utah

This paper is a strong argument for public ownership and control of wild lands. However, to be effective, such control must be free from inter-bureau jealousies and questions of jurisdiction, which is possible only by adopting one territorial jurisdiction and head interested chiefly in the right use of land and in the conservation of its resources. Of the national forests as a unit of wild land, the author believes we should get back to the original concept of managing them for the production of *commodities*, timber and forage; *uses*, recreation and game; and *services*, such as watershed protection, all of which are inherent in the land.

I WOULD like to start with a definition of the word "conservation" which Richard T. Ely (1) uses in *The Foundations of National Prosperity*. It is "To use with care means conservation, but conservation means also still more than the term strictly construed signifies, it means improvement."

Assuming that "wild lands" are the uncultivated lands, that is, the timber lands, the watershed lands, the range lands, the brush lands and the barren lands, then our problem concerns 94 per cent of the area of the eleven western states. Aside from the privately owned land, state land and federally reserved lands they are largely the "Old Public Domain." But a "New Public Domain" is being created by tax delinquent and abandoned lands. For example, there are in the three Lake States over 25 million acres of tax delinquent land in different stages of abandonment. In New York and Pennsylvania land abandonment proceeds at the rate of some 250,000 acres a year in each state. In the entire country there are probably some 100 million acres of such land approaching almost the acreage of the still remaining "Old Public Domain."

Taking this vast area of "wild land" in this country and applying thereto Dr. Ely's definition of conservation of so carefully using it as to improve it, we have a

task ahead of us great enough to challenge the brains, the energy, the statesmanship, and the fighting qualities of the most virile men the profession affords.

Mr. George D. Pratt has said "Conservation of the soil, I think, can be set down as the first fundamental of both conservation and land utilization. If this is correct, it follows that our ability to carry our programs through successfully rests squarely upon our ability as a people to hold our soil and to conserve its life. I, therefore, maintain with all the emphasis at my command that the first objective of land utilization is to stop soil devastation and soil wastage."

During the past three years we have witnessed the failure of man-made combinations and of wealth built upon paper. We have seen enough to satisfy us that the only real source of wealth is that built upon natural resources. I place soil productivity as the greatest natural resource, without which no nation ever has been or ever will be great. We have full confidence that any nation or business which has back of it sufficient natural resources will soon come back. The nations recognize this. Japan is willing to risk a war in the face of the disapproval of the world to get possession of the resources of Manchuria, its soil, its forests, and its minerals.

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

We are gifted with but a limited vision as to the future needs of a nation and the future use of resources. That which is a detriment today may develop great values tomorrow. Witness the burning of valuable walnut forests in the clearing of land in the East. Under these circumstances we cannot close our eyes to the destruction of any resource. This paper is limited to the consideration of the principles of conservation applied to wild lands, although cultivated lands need the development and application of the same principles. With this limitation the discussion will be narrowed to wild lands, or those that are uncultivated. The entire question hinges upon the use or the kind of use, or the principles of land utilization that have been considered in the land utilization conferences. I can discuss only the western states, the lands with which I am familiar.

In the plains area of Montana, formerly covered with a good sod of grasses, there are vast expanses which are usable only as wild range. The urge for dry farming and the misguided thoughts as to the use of the land resulted in taking 40 millions of acres between 1907 and 1920, largely for dry-farm purposes. In the attempt to farm it millions of acres were broken and sown to one or two crops. In a great percentage of the cases no crop was ever grown. The sod was destroyed. Cultivation of crops was a failure, and all that is left after these attempts at farming is the loose soil which travels before every wind, and which nature is trying to reclaim by the establishment of abundant stands of mustard and thistle. In the "Triangle" country north of Great Falls where 18,000 farms had been taken and 75 towns built, 49 per cent of the farms were closed out by mortgages during 1920, 1921, and 1922. In 1917 at the Havre land office alone, there were 7,200 entries of homesteads for dry-farms, most of which never grew a single crop. This

land, abandoned before patent, reverted to the Public Domain. There can be no question that the land would have served the public better in its natural state, and would have avoided the ruination of thousands of homes built in hope, and after years of heart-breaking struggle abandoned to the Russian thistle and the dust storm.

Owyhee County in southwestern Idaho having an area of over 5,000,000 acres, of which 70 per cent is open Public Domain, was once the promised land for the livestock producer. However, the evils of unrestricted open competitive use have brought about a decline in productivity of the range until it is now only 10 to 20 per cent as good as originally. That decline has witnessed the almost complete disappearance of the nutritious bunch grasses from the range and has been attended by the removal by erosion of the best surface soil. Today there are only 20 to 25 per cent the number of stock grazed in Owyhee County as compared to the peak of grazing reached in 1888, and only 30 to 40 per cent of the number of a subsequent peak reached between 1910 and 1915.

The ranges in the State of Nevada, of which 73 per cent is open Public Domain, according to a recent study, have declined an average of 60 to 70 per cent in forage production as compared to the former condition. The peak of livestock raising was reached in the decade 1910-1920, but since that time it has witnessed a steady decline until now there are only 70 per cent as many stock as during the peak days. Even today all of the readily accessible range outside the national forests is overstocked.

In Utah unrestricted grazing and fire on wild lands is resulting in a gradual increase in floods, an increase in gravel and other detritus deposits on highly valuable cultivated lands, on highways, and even some towns are being ruined.

In the Forest Service Region 4 part of

Idaho, in 1931, a severe fire occurred along the rough breaks of the Salmon River. It must be admitted that we of the Forest Service then felt that but little was lost through the burning of some of this rough inaccessible territory having in general only scant timber and brush cover. An extremely heavy rain occurred early in 1932 which struck upon the watershed of Warren and the nearby creeks within the area covered by the 1931 burn. The result was the deposit of an immense amount of soil, gravel, boulders and debris in the Salmon River, aggregating millions of tons. So great was this deposit that the course of the large, swift river was forced to one side of the channel and the river current will be carrying away this deposit for years. A careful examination of the scene of that rainfall made during the last month or two developed the fact that within the area involved the rain which struck patches of unburned timber carried down no detritus; that wherever a gulch or canyon was completely burned and the rain had direct access to the burned-over ground, the soil did not withstand the flood.

On the deserts of Utah and Nevada a study during the past few years has demonstrated very clearly that there has been a decline of the better forage plants, and that losses of stock have been greatly increasing because of lack of food or of malnutrition in the food available. To be sure, we meet the argument that these conditions are lack of rainfall during recent years. It is admitted that a year with high precipitation results in improvement of these desert ranges, but it does not bring back the forage species which have disappeared, always the most palatable ones. One thing is sure, that the average carrying capacity is being gradually reduced, and that there is a steady increase in the ratio of loss.

It appears perfectly clear that the lack of application of conservation principles

to lands such as I have mentioned, which involves the wrong use or improper use, or lack of care, culminates in the deterioration of resources, both directly and indirectly. The direct results are a decrease in the palatable forage plants, a decrease in the carrying capacity for domestic stock, and increase in losses through lack of forage and malnutrition through eating poor plants, and an increase in death from eating poisonous plants. It also results in soil depletion by erosion, decreasing its productive capacity and the deposit of detritus on more valuable land. The damage to farm lands, to roads, to reservoirs, to other irrigation works, and to navigation due to these deposits is rapidly increasing.

On January 1, 1931, in the eleven western states there were 10,007,000 cattle, valued at \$408,986,000; there were 1,997,000 horses, valued at \$85,271,000; there were 192,000 mules, valued at \$10,598,000; and 29,287,000 sheep, valued at \$165,471,000; making a total value for these four classes of livestock of \$670,326,000.

In the eleven western states the total feeds for all livestock, including beef and dairy cattle, horses, mules, sheep, goats, and swine, comes from the following sources: Harvested crops 23 per cent, plowable pasture 15 per cent, other farm pasture 17 per cent, national forest 10 per cent, and uncontrolled range, most of which is open public domain, 35 per cent.

In the eleven western states there were 172,258,379 acres of unappropriated and unreserved public lands, or so-called "Public Domain" on July 1, 1932, or approximately 23 per cent of the total area of the eleven western states is open public domain.

In some of the western states the figures run much higher than these averages. In Utah, livestock obtain 77 per cent of their feed by grazing and 48 per cent of the area of the state is public domain

and about 50 per cent of all livestock feed comes from the public domain. In Nevada, livestock obtain 85 per cent of their feed by grazing and 73 per cent is public domain which supplies about 60 per cent of the livestock feed. In Arizona, livestock obtain 93 per cent of their feed by grazing and 19 per cent is public domain which supplies over 50 per cent of the total livestock feed.

The range lands have a very important relationship to agriculture as a whole. Rather than take time to show this relationship in all the states, I will use Utah as an example. The livestock industry is third largest in the state. About 83 per cent of the state is range land and, as previously pointed out, 77 per cent of all the feed for livestock comes from the range. Some of these livestock graze yearlong upon the ranges, while others graze only during the summer months and are fed on the farms in the winter, thus supplying a means of marketing forage crops, of building up or maintaining soil fertility, and of making the crop rotation plan possible. A market for farm produce in communities long distances from railroads depends largely upon the availability of livestock to consume forage crops. The sale of livestock and livestock products brings in about 43 per cent of the gross farm income of the state. In addition, about 15 per cent of the forage crops are marketed by feeding them to livestock. From the standpoint of the livestock industry, it is imperative that range lands be available, for it costs from four to eight times as much to feed an animal on harvested crops as to graze it.

I need only remind you that many people obtain their livelihood directly from the livestock industry; that livestock supplies much of the transportation business; that property connected with the livestock industry constitutes a large amount of taxable wealth; that people en-

gaged in the livestock business are an important market for many commodities.

The subject of the importance of range lands is a big one and I cannot begin to exhaust it. I do, however, want to mention the relationship to watersheds. Some of us think of watersheds in the West only in connection with national forest or forested lands. This is not always the case. In Owyhee County, Idaho, for example, practically none of the land is forested, almost all is range land, and 3,672,760 acres, or 69 per cent of the total area of the county, is open public domain. This county is the bulk of the watershed for various streams under which 86,804 acres are irrigated and there are 12 water storage projects with a capacity of 770,160 acre feet.

In Elko and Humboldt counties, which make up most of northern Nevada, most of the area is range land and 11,618,510 acres, or 68 per cent, is public domain. This public domain is an important part of the watershed in the two counties. In 1930, from 11 drainage basins in the two counties, 180,228 acres were irrigated and the irrigation projects were capable of supplying 331,389 acres with water. There was a total investment of \$2,949,462 in irrigation enterprises, including 12 dams, 1,530 miles of canals, and 19 reservoirs with a storage capacity of 106,767 acre feet. These figures might not sound big in California, but they are big in Nevada.

Now just a brief statement on the condition of the open range land. I know it is general knowledge with this group that the public domain is badly depleted and rather seriously eroded. Within the past few months members of my office made detailed studies of the open range compared to moderately grazed range of the same type and found 69 per cent depletion of the sage-grass type and 58 per cent depletion of the desert shrub type on the public domain in western Utah, 68 per cent depletion on the Snake River

Plains in Idaho, 81 per cent depletion in Owyhee County, Idaho, 72 per cent depletion in northern Nevada, and 58 per cent in central Nevada. In western Utah and central Nevada the moderately grazed range used for comparison was no doubt depleted somewhat or the public domain there would probably have shown heavier depletion. I suppose the above studies are indicative of what has happened to much of the open range in the western states.

The need for the application of conservation principles to wild lands can, I believe, be most clearly realized by considering game animals and game birds. The bird surveys in the eastern states usually contain pleas for the leaving of corners of wild land in otherwise cultivated fields and for protecting the wild lands for bird habitats and nesting places. There is no doubt in my mind that our western game birds are suffering from the trampling of nests through unrestricted grazing on wild lands with no administration. Our water fowl has faced destruction through unwise drainage projects and through use of land inimical to their welfare. The welfare of the big game animals of the West depends almost entirely upon their ability to secure winter range. The winter range of most game animals is on wild lands. Unless some principle of conservation is applied to wild lands needed for game range, the restoration of game is bound to be limited and chances for game will, as time goes on, become less and less as the wild land range is destroyed.

As I think of this problem, the greatest need is for *action*. It does no good for us to hold learned discussions on the principles of conservation, or to bring ourselves to a high pitch of thinking in terms of watersheds or of conservation and then adopt non-conservation action, or worse still do nothing. We catch ourselves now and then weighing the cost of conservation efforts against immediate cash returns. President Roosevelt did not

weigh the cost when in 1905 he created millions of acres of national forests. He took action. The matter is not entirely one that we have been pleased to term business in which the dollar mark is predominant; it is one of public service which should be performed now, and for which the public is willing to pay if results are produced. Moreover, in our shortsightedness none of us can evaluate many of the benefits which must come from the application of sound conservation principles. None of us can afford to allow any of the resources of the wild lands to be destroyed or to deteriorate simply because we cannot see far enough ahead to reduce the values to dollars and cents; nor can we wait action pending the settlement of all the jealousies and the questions of jurisdiction between departments or bureaus. Here again we need action. We have done altogether too much thinking about the functions of various agencies. Under this functional idea we have within the same territory two or more agencies handling grazing; two or more agencies handling timber; two or more agencies constructing roads; two or more agencies making maps. I do not think that conservation will ever be properly applied until we get away from the functional idea of organization and adopt one of territorial jurisdiction under which one head interested chiefly in the use of land and in the conservation of the resources welds together all the various expert assistance needed, and the entire matter goes forward under one central head of administration. The problem is one of land administration and all services on the land should be knit together in one body. I think we want to get back to the original concept of the national forest as a unit of wild land to be managed for the production of *commodities*, such as timber and forage; *uses*, such as recreation and game; and *services*, such as watershed protection, all of which are in-

herent in the land. One directing head for the production of these commodities, uses and services can correlate and direct the activities along one straight road toward a definite goal.

If we have thought enough about the principles of conservation and the need of their application to wild land, we probably should give a few minutes to the consideration of what governmental agency is in the best position to apply such principles. I think we have all seen enough of private ownership of timberlands, or range lands, and of any kind of land upon watersheds to satisfy us that there is no need of expecting such ownership to apply the principles of conservation which are necessary if the public interests are to be protected. Richard T. Ely in his *Introduction to Political Economy* published back in 1889 presented the view that "The state (used in its generic sense) is the corner stone of wise conservation policies; a very *sine qua non*."

Dr. Ely says again: "Adequate conservation in general means a course of conduct in economic affairs which is dictated by the common interest, but which will not be followed sufficiently by the private person under a system of *laissez faire*, or non-intervention.

"Every step forward in civilization means increased regard for the interests of the future."

Dr. Ely says further: "But there is a sharp limit to the economic sacrifice that we may reasonably and ethically ask the private person to make for even the present welfare and the limit is still sharper when we come to consider the interests of future generations. When it is possible and as a general principle, social burdens should be socially diffused and socially borne.

"The one outstanding conclusion to which the discussion thus far has brought us is that, however much may be done by individuals and by private business organ-

izations to husband the natural resources of the nation, the formulation and execution of a comprehensive conservation policy is fundamentally a government function."

B. E. Fernow in 1895 said (Address "The Providential Functions of Government with Special Reference to Natural Resources." *American Association for Advancement of Science Proceedings*, 1895, Vol. 44): "It is true that as individuals the knowledge of the near exhaustion of the anthracite coal fields does not induce any of us to deny ourselves a single scuttle of coal, so as to make the coal field last for one more generation, unless this knowledge is reflected in increased price.

"Mark, we do not create this special providence for the individual, but for society; the individual will have to work out his own salvation to a large extent with the opportunities for advancement offered by society, but society itself can only act through the state or government, and as the representative of the future the state cannot, like the individual, 'let the future take care of itself.'"

The instances where private owners are willing to do things are so few that they hold out no hope of general application.

We have heard much about states rights recently and the turning over of a lot of wild land to the state, but I have yet to see the state which, in my opinion, is doing a good job handling its lands or one which can be expected to do a proper job. Questions of taxation are too acute and the taxable wealth is not great enough in our western states to warrant any state taking over additional large areas of wild lands such as the Public Domain with any other idea than to exploit them to the fullest extent. Even though a state were financially able to handle the wild lands within its borders, the vicissitudes of state politics are so great that no permanent policy could be expected. The

state ownership of wild lands is to me, therefore, out of the question.

This leaves but one agency—the federal government. The only solution to the conservation question applied to wild land is federal ownership and administration.

There are many voluntary agencies, some of them sound, some of them with good ideas but poor leadership who are interested in the whole question of conservation. I quote George D. Pratt again: "From a stage of forest conservation we have passed into an era of conservation multiplicity, embracing all natural resources We have organized groups whose numbers run into hundreds. Some are national, some state, and many local in scope, but each specializes in some phase of conservation—forests, wild life, water, soil, oil, recreation parks, scenery, wild flowers, and so on. This conservation set-up is a tremendous present and potential asset to land utilization in that it represents an enlightened and organized public mind sensitive to the need of a common program of coördinated objectives, once such a program is formulated. Its present weakness lies in the multitude of different programs, each usually developed by specialists or enthusiasts in one phase of conservation who therefore lack

a complete knowledge of biological facts and relationships. These programs sometimes conflict, and in a sense they short circuit conservation progress until the defect is remedied."

Such agencies need heading up in some manner to make their work effective. The recent land-use conferences held at Chicago and other places are getting down to the fundamentals of the problem. There is an opportunity for this Society to take a strong position of leadership in the development of principles suitable to wild lands and in securing action to insure their application. We need to be not only foresters, but we need to broaden our vision and take an aggressive position of leadership on the entire question of the handling of uncultivated land.

In the assumption by this Society of this new leadership in a broader conception of conservation which includes not only forestry but the development and correlation of all of the uses, services, and commodities on our wild lands we need fresh, aggressive bold thought and action.

This is a direct challenge not alone to the experienced men, but to the youth of the profession fresh from training and eager for conquest.

DISCUSSION

Chairman Winkenwerder: We have had here two papers on one of the subjects which is of extreme importance to the whole problem. I hope we may have some discussion.

E. C. M. Richards (Pennsylvania): These last two papers I feel have more than repaid my little journey of 3,000 miles from the Atlantic Coast to hear them. I have one thought I want to pass on to you. Only recently I have gotten back from Europe where I went around with European foresters. Just one thing touching on these two papers. As I went

through the woods with them I was looking up at the timber—wonderful spruce and pine. I turned to the foresters and found them looking down at the soil. I was looking up at the timber. I was a forester, but they were looking at the soil, because they were forest producers. It is interesting when we see as I did the series of maps, 11 in all, maybe covering 10 years' revisions of working plan. Whole thing went back 110 years. When looking over their maps and talking to the men, found they weren't thinking about timber, they were thinking about the fact that 100

years ago this compartment grew at the rate of so many cubic feet of timber per year but that now under proper management they have doubled that rate of production. The soil was producing more. They were proud of their forest management. It was a revelation to me. I always had looked at the woods and not at the soil. I am convinced we should follow the lead of those foresters, think of ourselves as producers of forests, think of the soil and of sustaining that soil, and of building it up so that in the future we will pass on a soil with greater capacity to produce, that the soil will be built up by our activities.

Zon: I, too, am tremendously impressed with the papers, but I wonder if we are all thinking of the right thing. I think the second half of Rutledge's paper saved the situation. Those fellows are talking

about the physical side of conservation. Of course, there is the side of soil erosion and conservation. But primarily conservation is not a physical process, it is an economic process. Conservation means the relationship of man to land. Conservation is an economic policy which means the control of natural resources by people for the benefit of the people. The test of conservation is, who owns the land. I hear a great deal of talk about erosion. I think erosion is not the friction of the rain water on the land, but the friction of the farmer's mortgage against his farm. Conservation through control of natural resources by the Government is an economic philosophy.

Chairman Winkenwender: Is there anybody here who believes these lands should be turned over to the state? If so, we would like to hear from them.



"The instability in the forest situation of the Pacific Northwest arises primarily from causes which long antedate the depression period in time and will also extend materially beyond its hoped-for early termination. It arises primarily from the basic fact that the Pacific Northwest is still and must for a considerable time remain in the economic stage of liquidating investments in virgin timber and facilities for its conversion. The exigencies of liquidation of burdensome investments, enhanced by a burdensome and almost confiscatory method of taxation, control timber and lumber values in this region and, hence, dominate industry thinking and industry planning. The industry must, as an economic evolution, get this liquidating stage substantially behind it before we can reasonably expect a degree of stability sufficient to permit any general or serious undertaking of long-time forest management."

From *The Outlook for Timber Management by Private Owners*,
by W. B. Greeley, in this issue.

THE TIMBER PROBLEM IN CONSERVATION¹

By F. S. BAKER

Associate Professor of Forestry, University of California

The old threat of timber famine, which foresters used to arouse themselves and the Nation to active timber conservation, is so far from working out that the foresters, themselves, have lost faith in it. The author believes it is impossible to strengthen this old concept enough to make it effective and that, therefore, it should be abandoned. He finds other reasons for conserving timber: the protection of the potential producing power of the soil, watershed protection and forest recreation on a commercial basis. The forestry involved is of an extensive rather than intensive type and requires mainly adequate protection against fire. Sinclair Wilson, who discusses this paper in comments that follow it, believes that the cry of timber famine served a good purpose in arousing the people from lethargy to keen interest in the forester's objectives. He stresses the long-time and human values that are jeopardized by the wreckage of forest soil productiveness.

AS FAR as this Society is concerned, conservation has always meant essentially timber conservation, partly because we are first of all foresters, and partly because we believe that by conserving our timber supplies we automatically conserve the many important secondary products of the forest—water, recreation, wild life and so forth.

This meeting is dedicated to a careful study of our basic positions, an analysis of progress and an outlook into the future, and nowhere do we need more careful self-examination than in our own particular field of timber conservation.

Now, what are the facts? What have we actually accomplished since forestry came on the American scene? We have first of all a series of national forests upon which some \$4,000,000 is spent annually for protection—an impressive sum, yet only about 4 cents an acre of national forest land. On lands outside the national forests a matter of some \$7,000,000 more is spent annually for protection of forest lands by federal, state and private agencies. The test of progress is not in dollars spent so much as in what is accomplished with these millions. That is harder to express, for protection of our forests is carried out against ever increas-

ing hazards, as human use of our forest lands for recreation increases, but the consensus of opinion is that these dollars are well spent and the public and timberland owners are getting their money's worth. That surely is progress.

Fire is not the only destroyer of the forest. Destructive logging has also played its part. Against this evil, foresters have launched many a windy attack, but to very little purpose. Yet ever since 1914, an effective weapon has been in their hands. In that year Ashe—a forester, let us be proud to say—first presented definite figures to show that the cutting of small trees was a foolish proceeding from the standpoint of profitable exploitation. This idea developed slowly enough. It was unorthodox. "Forestry" was not in it. Mere profit making happened to have a happy silvicultural by-product. In late years, however, we have seen a great spread of the idea, which, fortunately, develops most effectively in times of economic depression and poor markets. It is, of course, as H. H. Chapman calls it, "involuntary forestry," and under changed economic conditions may logically be abandoned, but foresters should be grateful to any forestry that will tend to minimize forest destruction at the present

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

time, and encourage holding land for a second crop. I am afraid that among the purists of the forestry profession this "economic selection system" or "selective logging" is still looked on as rather without the pale of forestry. Nevertheless these two factors—increased protection and the spread of selective logging—seem to me the chief accomplishments in timber conservation in the last twenty years, and I believe they have done great good in stemming the tide of forest destruction. (This is, of course, leaving out all consideration of better and closer utilization of the felled tree, in which no small progress has likewise been made.)

They tell us, however, that all this is not sufficiently effective. The well-known 80,000,000 acres of devastated land of the Capper report are not shrinking but are being added to as the years go on. Foresters tell themselves repeatedly that this situation *must* be remedied. They express a world of determination but nothing very revolutionary takes place. After many years of this sort of thing, hope long deferred seems to have made their hearts sick and many foresters are beginning to doubt whether they can ever bring American forest lands measurably close to their ideals, and, far worse, they begin to doubt whether it is even necessary that they should try to.

Fifteen years or so ago forestry crystallized its faith. "Forest devastation must be stopped or there will be a timber famine." That was its keynote. At the time, the thesis appeared to be very reasonable, and, because it was a formulation of what they wanted to believe, most foresters embraced it with enthusiasm. Personally, I have always thought that as a piece of logical argument, the development of the thesis in numerous publications was shot through with serious technical errors, but as nobody ever agreed with me there, we will waive that point. More seriously it was based upon a picture of a rapidly declining virgin forest supply, unsatisfactory second-growth, coupled with very

high demands and resulting high prices—a picture that is so far from developing along the lines mapped out for it that foresters are losing faith in their dogma; and just as in the field of religion the man who has his pet theological theory upset tends to lose all faith, foresters, because the timber famine is not coming off according to schedule are losing faith in forestry. If not to meet an inevitable shortage, why grow timber? Why protect what may never be required to serve a great national need? Why timber conservation at all? These questions seem to be sapping the enthusiasm of the whole profession. We must admit that the timber famine idea can never be proven until the famine comes, and since lumbermen never did take our timber famine argument too seriously, and since foresters have no longer an effective faith in them, it is perfectly clear that we must throw that idea overboard. I can see absolutely no means of effectively strengthening it.

The immediate future is far less certain than it was even fifteen years ago. Methods of preparing and using wood and its competitive materials are in a stage of kaleidoscopic change. Maybe we are headed for an early day in which demand for wood will become higher than ever; perhaps we face a long depression. It is a merry battle between wood and its substitutes, and the outcome—regardless of what we hope and believe it will be—is hardly so assured that we can develop enthusiastic timber conservation by timberland owners, whether they are lumbermen or political units, on the basis of an impending famine. I am wholly unable to agree with those people who interpret the failure of the Capper report famine to materialize as meaning that America will never require anything like the full productivity of her forest lands. As we consider the whole progress of the development of America and of our civilization it seems inevitable that more uses for wood will continue to be found and that it will forever maintain its superiority in

certain large fields. It also seems clear that while our per capita consumption may continue to fall for a long time, our population is likewise destined to increase for a long time. America is still far underpopulated on European standards. In the day when America's population is more nearly related to her full power to support that population than it is now, I am fully convinced that the demands for timber will certainly be at least as great as they are now in western Europe—high enough to make profitable forestry possible.

And in some far day we are surely destined to live much more on the earth's current income and far less upon her stored-up resources of coal, oil, iron, copper and other non-replaceable products. What of forests and forestry then!

But these, you may object, are vague and far off times. The old famine bogey may have been false but it seemed to be crashing about our very ears and calling for instant action. These points are perhaps truer and more certain, but they do not call for immediate conservation of our present timber resources.

Personally, I am only moderately concerned about the conservation of our present timber resources, as resources. Suppose that our virgin timber does run out; suppose we do have to use substitutes that are not "just as good." In a word, suppose the orthodox famine picture does develop. Raising timber crops would immediately become profitable and forestry would at once develop in the healthy atmosphere that this "child of need" has so often grown up in Europe.

Think yourself, which one you would remember most vividly, the man who taught you to swim or the life guard who pulled you out as you were going down the third time.

Thus, from the point of view of the present timber resources, I do not really care so much about our preparations for this big famine even if it does come, except that they do tend to encourage the

development of forestry method now rather than in a day I may never see.

The one thing we must not lose, however, whether this timber famine develops or not, is the producing power of the land. If a timber famine comes and we want to raise timber and cannot do so, we surely are in a bad hole. Even if we want to raise grass or agricultural crops in some later day on these once-forested lands and find their crop-producing capacity is lowered or gone, then we do have a real national loss. Thus, while fire and destructive logging waste a resource, the need for which may be rather sharply felt in the next generation, the most unfortunate phase of the situation is not the mere loss of the essentially replaceable resource but the destruction of the power of production that goes along with timber mining.

Erosion of fertile soil will do just this and is, therefore, a most serious consequence of forest destruction in mountainous lands, in certain soil types and in regions of violent rainfall. To restore the soil mantle is often a process requiring literally geologic time. Even though erosion may not take place, soil deterioration may follow forest destruction, especially after fire. For example, it is fully established that in fires much nitrogen is lost from the forest litter and soil, passing off as gases into the air. Now nitrogen is an essential plant food, and it is not a natural constituent of soil-forming rocks. To waste it in smoke is surely a senseless proceeding as every fertilizer-using farmer would realize. Complex reactions follow fire, however, and the effect of the loss is often not immediately apparent. In fact, the forest experiment stations have hardly considered it in the press of more striking problems. It must be an important factor in the long run, however, and one we cannot afford to overlook.

The physical characteristics of the forest soil change, following forest denudation. Soils become less absorptive of

water, less easily handled, less productive. Weeds and worthless brush species come in and occupy the area.

Now, according to most popular concepts, nothing should be easier, whenever economic conditions change and this devastated land is wanted for forest production, than planting the area and rededicating it to forest. Actually nothing in all silviculture has been so generally disappointing to the forester. Forest trees, in spite of the fact that they maintain themselves in poor rocky soils, in uncared-for stands and in rigorous climates, are really very delicately balanced with their environment in very many cases. They are not the weedy pioneers like our cereals. They need certain conditions for flourishing growth—conditions that are not those of burned-over and logged-off lands. Thus we find disappointing results with plantations on cut-over redwood lands, especially on south slopes. Western white pine, a species which comes in after fires, has proved unexpectedly difficult to establish on broadcast burned lands in north Idaho. Even under the favorable conditions in Germany, spruce planted on land that has been cultivated develops poorly. In some parts of Spain, where within historical times excellent pine forests stood, fire and grazing has caused such deep-seated soil deterioration that plantations now prove impossible. And so it goes. Forest lands must be kept as forest lands to maintain their productivity. Biological consequences of the utmost importance follow failure to observe this rule. Here are consequences that are demonstrable and certain, obeying natural laws and not subject to the uncertainties of prophecy in the economic field. Biological research is sorely needed to confirm and study these widespread observations and to impress their significance upon timberland owners. This is the heart of timber conservation.

There are two side issues that foresters certainly should use to supplement their arguments for timber conservation.

The first of these is the water crop. This is a matter of great importance, especially in regions where irrigation is practiced, and I believe it can best be safeguarded by maintaining forest on the watersheds. Since the forest owner does not as a rule sell or even harvest the water crop the public has a great interest at stake here and this should probably be the chief justification of public participation in forest protection. Similar conditions hold upon watersheds at the headwaters of important streams in whose lower courses erosion and floods are serious. Well maintained forests are the most satisfactory cover.

A second aid to timber conservation lies in the chance to make forestry profitable by realizing on the recreational values of the forest. There is undoubtedly a good deal of loose talk about the importance of recreation, and a good deal that does not appeal to the more conservative forester and woodsman who looks upon the forest first of all as a timber-producing unit. I think it is clear, however, from trends of the time, that automobiles, roads, and leisure are bound to increase for many years. The recreational use of the forests is certain to increase under these circumstances. In accordance with American traditions of freedom in the wilderness the public is being furnished with ever increasing "free" recreational facilities—paid for indirectly by general taxation. As a result the public is assuming free enjoyment of the forest as a natural right. This may have been reasonable when his presence caused no expense to the forest owner, but when camp grounds are prepared for him, water is piped for his convenience, signs are erected, and guards patrol the property to see that it is not burned up, the user ought to pay for using the forest. He ought to be taught this before his concept of inalienable rights in the woods gets any better developed.

The private forest owner clearly has the right to charge for recreational use of

his property but what chances of profit or of teaching the public to buy forest recreation has he, with all the competition of free parks and forests offered by the state and nation? With an accepted system of charges the forest owner could realize upon the recreational value of green forests. If people got the habit of going out for the week-end and paying a small fee for the use of a bit of forest, a surprising business might well be developed which would be a great stimulus to forest conservation. How many million dollars' worth of time and money do you suppose home owners spend on lawns each year? What is the national shaving soap bill? It's all in getting people to think the idea is right—and on this recreational idea we ought to begin educating the public.

To summarize, then, we have made progress. Millions of dollars are being spent annually for forest protection and the economic selection system of cutting is actually developing the practice of forest cropping on the ground. But, in spite of this, things are not proceeding fast enough to satisfy us and the only charm we knew, "timber famine," has lost its efficiency. It brings no action and we are left stranded.

We had better throw that old charm away and try to develop a new one, not so gaudy and striking perhaps, but more

effective in the long run, something we can come to grips with.

1. Forest land must be maintained as such or its power to produce forest may be impaired or wholly lost. This is a potent argument to all who believe that every acre must ultimately produce its utmost for the well-being of the nation.

2. The maintenance of forest cover is the best insurance of the water crop and the best preventative of erosion and irregular streamflow.

3. With a proper policy, recreation should be developed as a profitable by-product of a well maintained forest.

For these reasons we must maintain our forests in a productive state, and if we do this we automatically get the essentials of timber conservation and build up a reserve against that still possible famine; and if the famine never comes in the form we have pictured it, we yet have very adequate reasons for practicing forestry on lands not needed for higher uses.

Let us, therefore, forget our old formula that did not work, and not worry too much about supply, demand and prices for the next few generations, but develop a much more certain attack on the basis of the disastrous consequences of forest destruction upon the everlasting productivity of forest lands, upon water crops, and recreation, and thus achieve timber conservation obliquely.

COMMENTS¹

BY SINCLAIR A. WILSON

Senior Forest Economist, Pacific Northwest Forest Experiment Station

PROFESSOR BAKER'S excellent paper on The Timber Problem in Conservation might be summarized as follows: "The chief accomplishments in timber conservation in the last 20 years have been increased forest protection and growth of selective cutting practice; the former

and the latter better conserving the natural forest cover and thereby conserving the soil's productive capacity: nevertheless, things are not proceeding fast enough to satisfy us, devastation continues and the only charm we knew, 'timber famine,' has lost its efficiency." Professor Baker

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

then suggests that the old charm be abandoned and that we think and act in terms of a more effective one, and recommends the following: maintain forest land as such for the conservation of producing capacity of soil, for insurance of the water crop, for retarding the processes of erosion, for aiding flood control. As an inducement to private capital and enterprise to participate in conservation he offers supplementary income from water crop and from recreation. I take it that Professor Baker is not in sympathy with over-emphasis and urges that we get down to fundamentals. I note that his stressing soil conservation through timber conservation is based on future needs of humanity for products of the soil. I agree with much that he has said, disagree with some that he has said, and rise to the support of some things he has left unsaid.

I can agree that forest protection from fire, disease and insects is desirable, and that we have made advances in that direction. I can agree that growth of selective cutting practice may leave upon the ground some cover. I can agree that both protection and cutting practice influence productive capacity of the soil, but I cannot agree that these are the chief accomplishments in timber conservation in the last twenty years. To my way of thinking, the greatest accomplishment has been the arousing of the American people from a lethargic attitude toward timber conservation to an attitude of keen interest in doing what they are able to do if they can be shown how to do it.

To that end some good may have come in the use of the term "timber famine" along with a flock of "shalls" and "musts." Perhaps it was necessary to do the arousing by an emotional appeal, and to that end the extreme use of words may be pardoned or given a suspended sentence. But if we resort to emotional appeal continually, we will need sedatives to quiet the nerves that develop on the morning afterwards; and the antidote offered is all

too often a militant one, sometimes more reactionary than the emotion and oftentimes ineffective because of its impotency. Therein lies the shattering of the faith of *some* in the charm "timber famine." The lesson to be gained from this may be that proper definitions are at all times in order. May I suggest therefore, that we do not use the term "selective cutting" too loosely; that we define just what it means, then see if that is what we want at all times, or even half or a quarter of the time in all that timber plays in conservation, and finally apply it properly. At any event, history seems to show that many good things accomplished were preceded by an era of evangelism of some sort, by appeals to the emotion, and by imagination. Emotional appeal, no matter what its nature may be, does no more than start things going; it never finishes things up.

We may foresee the good that is to be done, we may have factored out our present objectives, but it is another thing to recommend that these things be done without furnishing the tools with which to operate. Forestry is a comparatively new science. We in forestry are in need of facts. Facts may be determined by trial and error, or by research, or by both. But gathering facts having to do with timber growing is a slow process because of the very nature of timber. We have two milk crops per day, two hay crops a year, a grain crop every other year, and a forest crop possibly every fifty years. But here we have made progress also. A great many of the practices initiated by foresters have been improved upon to the extent that non-operable timber is being better protected, operating timber on national forests is not being devastated, and in some private operating timber, there is greater promise of prolonging the life of the undertaking. That is progress, slow to be sure as the years go, but rapid as the trees grow. We may grow impatient, many may lose faith, but

let us understand that there is a limit to all human capacity to get all things done at once.

Is it worthwhile doing, is timber worth the conserving, why conserve anything? Professor Baker admits that we should conserve the timber so as to conserve the soil, so as to conserve humanity should humanity come to live largely from the products of the soil. Let us accept this as basic. Some research has been done in soil conservation, and when we know more of what we are talking about, the public should be educated. There is a fruitful field among not only timber operators but also among tillers of the soil. (It was not long ago that I heard a dissertation at a farmers' meeting to the effect that burning the grass and brush on stump land each year was a good thing because it "sweetened the soil.") But there is more than soil conservation to consider in human conservation.

Human welfare and the conservation of humanity is wrapped up in the credit of nations. The credit of a nation is not properly measured by the amount of gold owned, but rather by the character of its people, the amount of natural resources, and the wise employment thereof. The most durable nations will be those that are self sustaining.

As we waste these resources, as we produce a condition of devastation, no matter how much gold we accumulate by the process of conversion, we have weakened our basic long-time national credit. We will have limited our ability to become self-sustaining when the pinch comes, as it always does in the history of the world, and we will have limited our capacity to help other peoples and nations in distress.

Timber has value; it has a place in human needs, and it is a national resource. If we keep the soil productive, it is a renewable resource. It is a potential basis for broad national credit. It is a storehouse of wealth for it need not be

harvested every year, and as a storehouse, it is a basis for long time national credit.

We do know that our timber resources have been greatly depleted, and that large areas have been laid waste in the process. We do know that there are extensive areas that may be used for forest purposes not now needed for other uses. We do know that there is an empire suited chiefly to the growing of forest crops. We believe that we may employ much of the land for the production of profitable forest crops. We are going a step further, by a factual study, we are getting down to an actual inventory of our forest resources, the producing capacity of land, the needs for timber, the rate of depletion from which we may determine how much more we should undertake in rehabilitating timber for the sake of conservation. This is a decided accomplishment.

An injury to one unit of our economic structure injures the structure of the whole. The credit of the whole is dependent upon the credit of its component parts. Let us take the present day as an illustration of what self sustenance means in its application to certain regions. In the East we have a mass of people who could use wood if it were cheap enough. With their own available supplies fairly well exhausted, they must turn to remote markets if they wish wood, but wood is very expensive, and people suffer because they cannot purchase. They cannot even purchase the substitutes. To that extent there is an acute timber famine in parts of this country despite all our boasted wealth in gold. *There is some considerable merit* in converting some of that gold back into a source of wealth, such as timber for the sake of balancing the credit of timber-impooverished sections.

This Nation has repeatedly shown its willingness to use credit for the sake of human welfare. At home we have not been content to merely rest upon furnishing the basic needs of man, food, warmth

and shelter. We have been vitally interested in building up an intelligent, healthy, fine minded people. But the schools, libraries, museums, roads and parks that we furnish cost money—and that money comes from revenue producing sources, from taxes and public revenues. Timber, when present, has always been a substantial contributing factor. It is another part that timber plays in conservation.

Timber and its manufacture affords vocational opportunities of both a temporary and permanent nature. It is a form of human occupation—a mode of life, desirable in the rounding out of a vigorous humanity. The history of nations with limited vocational opportunities is tragic. If we are interested in this kind of permanency, then timber is a conservor.

We as a Nation are interested in the distribution of wealth and relative economic independence among all our people, and are not friendly to concentration of wealth in the hands of a few. I know of no industry that distributes its dollar

so broadly among men as the lumber industry. It is a means of checking class distinction. To that extent, timber plays its part in conservation.

If the wheels of industry at large are going to shorten the working hours of men, or if we have recurring periods of depression in the future, we are going to have idle men. By placing them at work in our timber, we will have accomplished much more for them than if we stood them in a bread line, and we will have accomplished much more for ourselves than if we spend our gold, resulting largely from the conversion of natural resources, on non-productive public works.

I believe we are vitally and continuously interested in conserving timber as timber—in using it wisely through the ages—in preserving this magnificent industry, which we unfortunately find prostrate—in paving the road to permanency with all the courage of the forest evangelist supplemented by the experience and knowledge of today.

DISCUSSION

Mr. Wilson asked Mr. Winkenwerder whether we have any towns or communities likely to be abandoned because of timber depletion.

Chairman Winkenwerder: I think probably everyone could think of some specific instance. In the State of Washington we have a number of cases. I think of two where we have had industrial centers that have been built up around timber resources. I am glad Mr. Wilson has taken this view. We have one community with 80,000 people. The territory surrounding that community is partly agricultural but to a very large extent the industrial center has been built up on wood. At the present time we find the situation there very serious. The supply of raw material from the forest leading

into that industrial center is about gone and unless we get busy, so to say, immediately, and see how we can ship material into that territory from surrounding territory while building up new sources of timber, it is going to be very serious. A detailed study of land use must be made so that we can assign land to the use for which it is best suited. The other community has no agricultural land at all. They had to ship in agricultural crops. They have had a failure so bad that there is only one bank left in the community. What I would like to emphasize is that if we had in time taken up a study of the proper relationship of the development of these communities to the raw material and made provision for continuous timber supply it would have meant the conserva-

tion not only of resources but of communities and the people dependent upon them.

Mr. Wilson: I would like to say something about the taxation of timber. Something has to be done if we are going to conserve the source of taxation in timber. I wish to cite something that was cited at the last meeting of the North Pacific Section of the Society. One company was cited as having contributed heavily to the Community Chest and then issued orders on the Chest for the relief of their own men. Another company, unable to contribute in cash, was able to get some farm land which was not in use, and put their men on the land working when they are not in the mill. There is no bread line in that community this winter. That industry is worth preserving. Famine may be caused if excess production shuts down operation. It is possible to have famine in a land of plenty. We have a sort of timber famine, on the Pacific Coast, of our own. Carrying charges are a factor in this. I will ask a question of Mr. Mason. To what extent does the price of money enter into carrying charges?

Mr. Mason: Well, of course, the higher the interest rate the greater the carrying charge. It would be very helpful to have cheap money as a matter of reducing carrying charges.

Mr. Wilson: What was the interest rate in Europe before the war?

Mr. Mason: My impression is, probably between three and four per cent.

Mr. Wilson: How have our interest rates compared with that?

Mr. Mason: We are a new country comparatively here. We have been developing, or exploiting, if you want to use that word. There have been many more opportunities for investment, and therefore possible to get higher prices for money loaned, than in Europe.

Mr. Wilson: What is likely to be our trend?

Mr. Mason: I believe there is no doubt that we will have a lot of capital seeking investment and finding a great deal more difficulty in finding good investments. That will tend to reduce the interest rate.

Mr. Wilson: How will this affect the lumber industry?

Mr. Mason: It will make it easier to own and carry private timber.

Mr. Wilson: Mr. Cronemiller, would it be possible for the states to hold timber for private companies till the time of cutting?

L. F. Cronemiller: I think that harks back to the whole problem as to whether carrying charges on merchantable timber at the present time are such that your operators can not continue. That is the great howl that is going up all over the Northwest now. What are you going to do about it? Advocate tax reform? Can that stuff be taken over by the state and held pending cutting? You will have to consider the economic situation in your state. I speak for Oregon where approximately 16 per cent of taxes are paid by the timber industry and in some counties those taxes go as high as 60 per cent. What would happen if the whole thing was suddenly turned over to some public agency and this company ceased paying taxes? It is a hard proposition. In an operating section of the state, perhaps you could turn it over to public agencies. Under the proposed yield tax on merchantable timber in Oregon, the owning company would turn over 12.5 per cent of the gross value at the time of cutting. After cutting, the state would become sole owner of the land and remaining timber, and the contract should provide for the condition the remaining stand is to be left in after cutting. The state has a responsibility in protecting land. It is a very detailed problem we are trying to work out in Oregon. The yield tax on merchantable timber will come up before the next State Legislature.

In case the land goes over to the state and a trusteeship is arranged, then the state should have a definite contract with the company that that land should be left in productive capacity. There is no question about that, because there is certainly some consideration to be given the company when a state or public agency takes it over. And before they allow the company to go in and cut timber there should be some contract or arrangement to keep it productive.

Mr. Wilson: I mention this because it is what we have been talking about all day. It comes close to home. It is a possibility. It is given you to work out.

Question of all of you. "Is the posterity we have heard about when many of us were boys, at the time they were talking about national forests, is that posterity the man of today?"

Chairman Winkenwerder: I think you will all agree that this paper of Mr. Wilson's is full of meat. It offers so much to think about that you won't object if I have him stay up here three minutes more, if we want to ask him any questions.

H. W. Cole: May I ask what limits in the case of yield tax legislation, can be placed on legislatures to keep to the 12.5 per cent tax?

Mr. Wilson: There is no attempt made in Oregon to tie the hands of future legislatures. That sort of tax to be proper should be in a position where it can be changed.

Mr. Cole: What is the significance of that to the timber owner?

Mr. Wilson: It is somewhat uncertain. There are those who feel that it will to that extent relieve the pressure they have today. The pressure is very real in some parts of Oregon. Taxes on timber have increased from 1.5 cents a thousand to 10 cents a thousand.

Mr. Cole: That legislation seems too slow to give the relief you seek. What is there to prevent the legislature, or any state legislature, in the interval, increasing either your forest fee or your yield tax to a point where it will equal if not exceed your present advalorem tax?

Mr. Wilson: Nothing but honor.

Mr. Cole: Take any one of the forest counties where the tax is largely contributed by timber interests. The counties have organizations set up to spend practically their entire revenue. What will be the effect when revenue is cut down from forest produce?

Mr. Wilson: I am glad you ask that question. There are a whole flock of irreducible minimums introduced by our political organization. We don't have the township system that New England has or the Lake States. Ours is a maze of overlapping taxing districts, which we got from Virginia, coming to us from Missouri. A careful check would show that it is possible to cut out a great many of the extravagant practices found in that region. I think you will find some people at work on that right now, preparing for what is going to come. They are not getting the taxes now, the timber is being cut out so fast. We have an instance up in Washington, where a schoolhouse that was erected cost \$25,000. It was in a timber region. They still owe on the schoolhouse and there are three children still in the school, two of the school-teacher and another a visiting child.

Speaking of irreducible minimums that can be wiped out, there are, in regard to taxation, three things that we are concerned with: 1. public need for revenue; 2. capacity of property to pay or of its owner to stay in business; 3. rights of creditors of public bodies.

THE WATER CONSERVATION PROBLEM IN FORESTRY¹

By C. L. FORSLING

Director, Intermountain Forest & Range Experiment Station, Ogden, Utah

The watershed problem is constantly growing more acute throughout the country. In the semi-arid West, water supply is the limiting factor in almost every kind of development. Although much has been said about the destruction of watershed values and of conservation of water in general, very little has been done to give these vital problems the attention their importance warrants as a public responsibility. The author, after discussing the various relationships between soil management and water control, outlines a broad line of attack, which if acted upon should alleviate the severity of the destructive forces now at work. Mr. Forsling's paper is followed by comments by Dr. W. C. Lowdermilk, also an authority on forest-water relations. The latter discusses the rôle of the forester in water conservation, the danger of too broad application of certain findings and the need for more measurements to get at basic facts.

WATER conservation is here used in the broad sense to apply to the influence of forest vegetation on streamflow, floods, erosion, and fertility of the soil. The influence of forests on climate as a phase of watershed conservation is purposely omitted in this paper, because of the many complexities involved and not because it is unimportant, for when it is more fully understood it will doubtless be found to be the most important of all forest influence relationships.

Water conservation as related to forestry, primarily is a problem of management, protection and utilization of watershed lands that will promote the plant cover and surface soil conditions most advantageous to favorable conditions of run-off and streamflow, the mitigation of floods, the prevention of harmful erosion and the building up and maintenance of soil fertility. The necessity for such management and protection of watershed lands is based upon the following conception as determined by experience, observation and study of the effect of plant cover, more especially its depletion, on water and soil:

1. The depletion of the plant cover and attendant litter and humus content of the soil, to a greater or lesser degree, de-

stroys the conditions favorable to the absorption of precipitation by the soil and the percolation of water through the soil to the subsurface run-off channels and eventuates in a relatively larger proportion of the precipitation running off on the surface of the ground directly into the streams, the consequences of which are to increase the height of floods, and to hasten and shorten the duration of abundant stream discharge. The depletion of coniferous forest stands in areas of large accumulation of winter snow, further contributes to earlier and more rapid melting of snow and to the flashiness of streamflow by reducing the shade which normally is a material factor in delaying and prolonging the spring melting period.

2. The increase in quantity and rate of surficial run-off which occurs as the result of depletion of plant cover and the concomitant lessening of the physical obstruction and binding effect which vegetation and its litter normally affords against erosion of the soil, permits the acceleration of erosion and increases the removal of soil from the slopes of watersheds. The abnormal material thus contributed to run-off serves to choke stream courses, to reduce the capacity of storage reservoirs, to clog irrigation ditches, to

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lessen the efficiency of hydroelectric development, to depreciate the value of water for domestic use and by the deposition of sediment or other debris, to destroy or damage subjected land and other property. Run-off on naked soils accumulates fine clay which tends to seal the surface and prevent percolation through the soil and a heavier surface run-off results. The surface run-off erodes gullies which gather water and discharge it from slopes more quickly than under normal conditions. Thus increased run-off and accelerated erosion form the vicious circle of increasing each other as the process continues.

3. The combined process of accelerated surface run-off and erosion which follow the depletion of the plant cover and the surface soil, contribute to or become the primary cause of violent floods and mud flows, more especially from torrential rains which, aside from the damage they do to the water supply, inundate farm lands, destroy homes and other property, block highways and railroads and at times destroy human lives. Floods of this type are definitely increasing as the depletion of the vegetation on watershed lands increases.

4. The increased and accelerated run-off and accelerated erosion of the soil, which follow depletion of the plant cover has the further destructive effect of reducing the ability of the watershed land to yield crops of wood, forage and other vegetation which most watershed lands are capable of producing. The enlarged run-off decreases the quantity of water absorbed by the soil, thus robbing the vegetation of some of the moisture supply essential to its growth. The surface layer of the soil normally the highest in water-holding capacity and nitrogen and other elements of fertility is the first to be removed by accelerated erosion and these losses lower the productivity of the soil. Still other detrimental consequences of accelerated

run-off and erosion and floods are poorer conditions in streams for fish culture, and the damaging of scenic and other recreation values situated along stream edges and in valley bottoms.

5. It is fully recognized that the plant cover utilizes some of the water supply in its growth processes, and that the gross water yield from a normally vegetated watershed may be smaller in some degree as compared to the yield if the vegetation is reduced or removed. This smaller yield is a distinct advantage in humid regions subject to river floods but under some conditions in the semiarid regions may reduce the gross annual yield of water for irrigation in some measure. However, the value of the additional water for irrigation which would result from the reduction or removal of the vegetation, is definitely known in a large number of cases to be offset one to many-fold by the resulting greater irregularity of streamflow, increased silting of streams and irrigation works, larger damage from floods and mud flows, the decreased fertility of watershed soils and the depreciation of recreational values.

6. The restoration of a plant cover offers practically the only economical means of restoring the fertility of depleted soils on a large scale. Where a forest cover will grow it offers one of the best opportunities for the rehabilitation of depleted farm lands in the humid regions. Such a cover affords the best protection against erosion and further depletion of the soil; the organic matter added to the soil each year will gradually restore many of the elements which have been lost through a long period of cultivation and exposure to the full effects of run-off and erosion; and, in addition to thus rehabilitating the soil, a forest cover will pay its way, at least partially, through the production of needed commodities.

The watershed problem is constantly growing more acute throughout the coun-

try. This varies in different parts of the United States, largely as influenced by climate. In the semiarid West, water supply is paramount. There it is the limiting factor in almost every kind of development. Precipitation in the low lands generally is too small for crop production; only in the more elevated mountainous areas is it sufficient to yield a surplus of streamflow that may be diverted for irrigation. It is scarcely more than 80 years since the Mormons began the development of irrigation in Utah. Today there are nearly 20 million acres of cultivated lands in the 17 western states chiefly dependent upon the run-off from the higher areas for irrigation. Most of the 11 million people west of the 100th meridian obtain their domestic water supply either directly or indirectly from mountain watersheds.

Already the limit of local water supplies is being neared in many localities. In southern California it is seen fit to build an aqueduct 225 miles long from Boulder Dam to Los Angeles, at a cost of approximately \$200,000,000 because local water supplies are no longer sufficient. This development is preceded by another aqueduct 250 miles in length from Owens Valley. In Utah today, thousands of acres of irrigated land have barely half enough water. Boise River valley in Idaho with its 360,000 acres of irrigated lands, is feeling the pinch of insufficient water supply especially in years of subaverage snowfall. Part of this shortage is due to necessary changes to crops that require more water or to other economic developments. At the same time the natural streamflow in some instances has become less favorable for irrigation use than formerly. During the drought which ended in 1931, many localities were faced with an unprecedented shortage of water. The net result is that many communities already heavily burdened with a heavy investment for water supply

are now faced with the need for additional expensive development. These are only a few examples which might be repeated many times in any state in the West, for practically throughout the West the present water supply is developed up to or beyond the present economic limit. It remains, therefore, that regardless of whether present difficulties are the result of the over-development of available water supply, unfavorable climatic conditions, or modified watershed conditions, every possible opportunity should be taken advantage of to maintain the most favorable conditions of streamflow in so far as watershed conditions are able to promote them. Maximum usable yield of water, regularity of flow, and freedom from wasteful floods all depend in some measure upon plant cover conditions.

The irrigation problem is being further complicated by the silting of streams and storage reservoirs. The Elephant Butte reservoir on the Rio Grande River in New Mexico after 17 years of use, already has 15 per cent of its storage capacity occupied by silt which has depreciated the original construction cost of \$4,536,000 to the extent of \$680,000. The Roosevelt reservoir in Arizona has been silting at a rate of approximately 7,800 acre-feet per annum or about 0.5 per cent of the total capacity. The Arrowrock reservoir in Idaho on a project where every available drop of water in storage is needed 3 years out of 5, has had more than \$100,000 of the original construction cost depreciated by silt deposits.

The Hoover Dam will accumulate silt at a rate of not less than 196,000 acre-feet per annum. This estimate is based upon measurements made by the U. S. Geological Survey at Grand Canyon which show that the average annual load of suspended silt at that point during a 5-year period ending September 30, 1930 was

302,000,000 tons.² To this quantity should be added the bed load estimated to equal not less than 20 per cent of the suspended load, which brings the total average annual silt load up to 362,000,000 tons which on a basis of 85 pounds to the cubic foot, amounts to approximately 196,000 acre-feet. This estimate is about 43 per cent higher than the previous highest estimate by Fortier and Blaney³ which was 37 per cent higher than previous estimates had indicated. The average construction cost for an acre-foot of storage in Hoover Dam when completed will be about \$3.00 or in other words approximately \$580,000 of investment will be destroyed annually by silt deposits. By the end of the 50 years when it is expected the original cost finally will have been paid, \$29,000,000 of investment in addition to the interest will have been taken up by silt.

The West thus is faced with the reality of many huge engineering undertakings becoming the repositories of silt removed from the watersheds. It is true that a portion of this silt is the result of natural erosion but there is abundant evidence that erosion has been accelerated by depletion of plant cover on the watersheds. Hardly a single major reclamation project in the West will be paid for earlier than 30 to 50 years after the date of construction. If the present rate of silting continues many of them will not have been paid for by the time the development of additional storage will be necessary. With the present lack of restoration and maintenance of at least a normal plant cover on extensive areas of watershed lands the rate of deposition of silt in storage reservoirs will increase instead of decrease.

So much for erosion in relation to irrigation. Floods, where torrential summer

rains occur, constitute another hazard in the semiarid West. The more destructive of these are not of the kind which occur more commonly in the humid region where the main streams break out of the banks following prolonged periods of precipitation but usually occur as violent floods or mud flows of short duration but of a highly destructive nature while they last. Usually these floods involve only the smaller tributaries of larger watersheds and the main streams are little affected. In 1930 there occurred approximately 30 of these floods in Utah alone, all but one of which can be attributed in some measure, to depletion of the natural plant cover on the watersheds which were visited by violent rain. The Red Cross reported 295 acres of valuable orchard and truck lands were permanently destroyed, 179,000 acres were flooded and damaged, and 134 families were rendered homeless in the state. The more serious of these occurred in Davis County where in addition to other damage, highways were blocked for several weeks and required an expense of about \$100,000 to repair and open them following the floods. In 1923, there was heavy damage and 9 lives were lost as a result of floods and mud flows in the northern part of Utah. Geological formations show that there have been no floods of similar magnitude to those of 1923 and 1930 in northern Utah since the shorelines of Lake Bonneville were marked not less than 20,000 years ago.

A flood and mud flow occurred in 1932 on the Idaho National Forest in Idaho which originated where the forest cover had been destroyed by a burn in 1931. Fortunately there was little property in the direct path of this flood, but the destructiveness of floods from burned over

²U. S. Geological Survey, Water-Supply Paper 638-D, by C. S. Howard, 1932.

³U. S. Dept. Agri. Tech. Bul. No. 67, by Samuel Fortier and Harry F. Blaney, 1928.

areas is indicated by the fact that a small tributary stream a few miles in length filled the swift flowing Salmon River with boulders and gravel to a depth of 12 to 14 feet for a distance of 460 feet in length and 260 feet in width. Floods and mud flows that have damaged or destroyed valuable orchard lands, towns and other properties, have come from burns in the short steep canyon watersheds of southern California.

Of equal importance but less spectacular than the damage and erosion of the more violent floods and mud flows in the West, is the insidious but continual eroding away of the more fertile top soils of extensive areas of forest and range lands following fire and overgrazing. A part of the Running Creek drainage in the Selway National Forest in Idaho was burned over in 1910. This area was reburned and the remainder of the watershed burned in 1919. The channel of Running Creek is now heavily clogged with sediment, an unnatural occurrence in the turbulent mountain streams of central Idaho, except where caused by fires. In 1932, 13 years after the last burn, there is still an excessive amount of soil and other material being carried into Running Creek from the slopes which were burned in 1919. The jungle of down snags and the brush which has come in following the fire has been unable as yet to restabilize the coarse granitic soil of that area.

Practically throughout the West most of the forest and range lands not under public management are more or less abnormally eroded. In addition to the contribution of this erosion to more rapid run-off, the silting of streams and other more spectacular erosion damage, it has impoverished the soil for future timber and forage production and watershed conservation. Millions of acres of open public domain and privately owned and state owned lands have been overutilized to the

extent that surface erosion has set in and removed the best surface soil.

The organic content and fertility of the soil in much of the West is naturally small because of semiarid conditions inadequate to support a cover that can rapidly build up the soil materials. Yet when first settled scarcely more than 80 years ago, the pioneers found a fair soil that had been built up through countless ages of natural processes. In less than a century, that soil on literally millions of acres has been materially damaged through the excessive use of the plant cover and subsequent erosion. A recent survey in the State of Nevada shows that the livestock industry as the result of range depletion and erosion of the soil has declined approximately 30 per cent since the peak was reached between 1910 and 1920 in spite of the fact that in the meantime some additional range has been rendered more usable by the development of new watering places.

A comparison of eroded with the uneroded range soils on the Boise River watershed in Idaho shows that the eroded soils have lost 77 per cent of their organic matter, nitrogen content has declined 75 per cent and the water-holding capacity of the surface 6 inches of soil, has declined 45 per cent. Experiments in Utah show that removal by erosion of the more valuable surface soil on forest range land is equivalent in reduced forage production to a decrease of 20 per cent in annual rainfall. It is evident that on extensive areas of wild land in the West plant cover rehabilitation is also a problem of soil rehabilitation.

In the eastern half of the United States as compared to the West, there is a surplus rather than a shortage of water. There the water problem chiefly involves flood control, erosion control, and the rehabilitation of soil on worn out farmed lands. The flood problem has been dis-

cussed in detail elsewhere⁴ and will not be treated here. The tragedy is that in spite of the appreciation of the problem so little has been done about it. While there is conflicting opinion and perhaps even some conflicting evidence, it remains a fact that reforestation of denuded lands must play an important rôle in flood control on the Mississippi and other major drainages of the East and in keeping excessive quantities of silt from entering the channels of navigable streams.

Abandonment of farm lands due in a great measure to soil depletion is a growing problem east of the Mississippi River. In 1816 Abraham Lincoln came as a boy to Little Pigeon Creek in Indiana where his father cleared away the virgin forest to prepare a farm. Now, scarcely more than a 100 years later, land in that section of Indiana is being abandoned for cultivation because the soil is worn out. During the decade 1919 to 1929, over 32,000,000 acres of land in the United States, mostly east of the Mississippi River, were abandoned as crop lands. These, to a large extent, are lands where removal of crop and animal products for many years without the use of fertilizers has resulted in the depletion of soil fertility, or where cultivation of sloping lands has resulted in loss of soil by erosion. Of these factors, erosion evidently is the most important. It is conservatively estimated that 17,500,000 acres formerly cultivated have been practically ruined for cultivation by sheet erosion and gully-ing beyond a point where farmers will attempt their cultivation or reclamation. Another 3,000,000 acres of bottom lands have been damaged or destroyed by deposits of sand, gravel and other debris washed down from lands at higher levels, thus making a grand total of over 21,000,000 acres that have been greatly re-

duced in value due to erosion. In place of the abandoned land and equal area of new land, much of which was fertile, virgin grass lands, uninjured by erosion largely because of the previous plant cover, has been placed under cultivation. Probably 10 to 20 per cent of the poorer lands now in cultivation in the eastern United States should be abandoned for such use. The question might well be asked where is a nation headed that is destroying the fertility of farm lands at a rate of 3,000,000 acres or more per annum?

Forestry can and should play a large part in the rehabilitation of these worn out and eroded lands, not necessarily because of the direct return from the wood or other products which would be produced, but because of the value of the forest cover in building up the soil. Sooner or later, especially if the present soil destroying methods of farming continue on the remaining tillable lands, but in any event at some future time, these worn out lands will again be needed for agriculture if the productivity of the soil can be restored. To rebuild the soil by the addition of artificial fertilizer is out of the question because of prohibitive cost. It is necessary to revert to the slow natural process of restoring a plant cover that will check further erosion and gradually build up the organic matter and other elements of which the soil has been robbed. Forest cover, where it can be grown, is the best for this purpose, first because of its superior ability to add organic matter to the soil as compared to other wild vegetation and second because a forest cover, if protected against fire, insures a more stable tenure of conditions favorable to rehabilitation than does a brush or herbaceous cover. After a hun-

⁴U. S. Dept. Agri. Circular No. 37, by E. A. Sherman, 1928.

dred years or so in forest, these lands should again be available for cultivation and in the meantime the timber crop will have paid some returns from the land. Not all of the abandoned lands, it is true, are suitable for growing a forest cover but a sufficient percentage is so adapted in the humid region to make it possible for forest cover to play an important rôle in the rebuilding of worn out soil alone, entirely aside from the more direct returns from the forest itself.

Water supply, floods, erosion and worn out soils—these are problems of the farm, the city, the county, the state and the nation. Almost daily some phase of the problem crops out somewhere. For many years forestry and forest lands have been recognized for wood, forage, outdoor recreation and beneficial influences upon water and soil. The recognition of water and soil problems in forest policy has been scarcely more than nominal. A good deal has been said but relatively little has been done in a real concrete way to give the water and soil problems the attention their importance warrants as a public responsibility. After all the watershed problem is more a public responsibility than any other problem in the conservation of wild lands. If a private owner chooses to neglect or waste the timber or forage resources of his own land, he is the primary loser and the public suffers only indirectly. But where indifference or abuse of land leads to the disturbance of streamflow, to the production of floods and erosion deposits, and to soil depletion on a large scale the dependent community is the primary sufferer. The interstate character of streams extends the watershed problem beyond the jurisdiction of individual states.

This is an age of so-called commercialism and business efficiency when the pressure to obtain immediate benefit leads to the neglect of requirements and welfare for the future. The best efforts toward

education, investigation and demonstration have not proven very effective in saving from damage or destruction even the more tangible benefits of timber or forage on lands under private control. When there is such failure in the conservation of tangible values, what can be expected from private or even local governmental initiative where the more intangible values of land such as water and soil are involved? Few, if any, of the states have adopted a comprehensive policy for water conservation in so far as it is affected by plant cover. There are literally millions of acres of land, both in the West and in the East, where watershed and soil problems are of primary importance as compared to timber, forage or other values, where management and protection is needed for water conservation regardless of what the future for the other resources may be.

Unfortunately the watershed problem has not been studied thoroughly enough as yet fully to understand all of the many intricate relationships. The relation of vegetation and water varies with geological formation, kind and character of soil, topography, climatic conditions and the character of plant cover. Seldom are these conditions alike for any extensive area and results which obtain in one locality cannot be applied at random. For example, results of thorough study in a locality of high gradient having a relatively impermeable soil with precipitation frequently occurring as torrential rain can not be applied with safety in a locality of low gradient having a deep, highly permeable soil which almost regardless of plant cover, will absorb any quantity of precipitation as fast as it falls.

There is abundant scientific evidence that accelerated erosion is occurring over extensive areas, practically throughout the United States and that this erosion primarily is the result of plant cover destroying activities of man. It is recognized,

however, that this erosion in certain localities is due at least in some measure to natural factors, as for example protracted periods of unfavorable conditions of climate. There has not been sufficient study fully to measure the part natural factors have had in these localities. Although such natural causes in the great majority of cases evidently are less significant than destruction of plant cover, it is important that sufficient analysis be made to determine the influence of natural as well as human factors.

These unclarified phases as well as the growing importance of the water and soil problem calls for a much more comprehensive program of watershed research than is now under way. Once all of the facts are known there will be but one fundamental course to pursue on any given area of watershed land. Should it be found as may prove true for some conditions that certain modifications in the natural plant cover on watershed lands is desirable for increased yield of water or for other purposes, the situation becomes more complicated than ever. The problem on such areas more than elsewhere becomes one for those skilled in the art and science of protection and management of plant cover in relation to water. Above all it does not mean that incomplete facts may be accepted as conclusive upon which to base a method of treatment, or that any important areas may be left to the unskilled to destroy or modify the plant cover. Regardless however, of the minor difference of opinions which may arise or what modifications in detail may be found necessary, there should be no further delay in taking action to apply better watershed management.

In broad outline, the attack on the water problem in conservation of forest and other uncultivated lands involves the following:

1. The classification of lands with re-

gard to their utility and importance for watershed protection purposes.

2. Lands in the open public domain, where plant cover is or can be made effective in regulating run-off and controlling erosion, should be placed under a system of management and protection that definitely provides for this objective.

3. All lands now under federal management should be reconsidered with the view to seeing that present use and protection is affording the fullest degree of water conservation and soil protection obtainable in the light of present knowledge of the subject.

4. The various states should adopt measures in the management, protection and use of their lands that will insure making the plant cover effective in regulating run-off and conserving the soil.

5. Critical watershed lands now in private ownership that affect a community of interest, should be acquired or controlled by a public agency.

6. The owners of other than critical watershed lands, should be encouraged to avoid use that leads to watershed injury, possibly through public cooperation. State nuisance laws should be amended to make possible public intervention where privately owned land is being neglected to an extent that a menace to the public interest is being created.

7. Abandoned farm lands, when suitable, should be planted to a forest cover. Public aid should be rendered where necessary.

8. Tax reverted lands of value for water soil conservation, should be retained in public ownership and managed by a competent public agency.

9. Water conservation research should be expanded to the minimum program necessary to obtain the fundamental facts for all of the more important conditions governing watershed problems.

COMMENTS¹

By W. C. LOWDERMILK

Silviculturist, California Forest Experiment Station

IN opening the discussion of Mr. Forsling's able paper I desire first to express agreement with the major conclusions. There are, however, three aspects of the subject two of which are controversial that require in my opinion special consideration. These aspects are:

1. Extensions, or explorations in the domain of forestry.
2. Survey of the boundaries of application of certain findings.
3. The place of measurements in the new aspect of forestry.

EXPLORATIONS

Director Forsling has extended the domain of the forester beyond dense forests to margins of plowed fields. For a long time in this country there has existed a great land area for which no professional group has felt responsible for studying the problems affecting it. It was a "no-man's land" between forests and fields. By the very nature of the agriculturist's interest tutored in annual harvests he concerned himself in small measure with the condition of these wide areas where immediate gains and exploitation were producing a menace to agriculture of the future. Likewise, silviculture was fully absorbed in its interests in growing timber for the lumber industry. It had become a special hand-maiden of the exploiting interests. Credit is due the far-sighted group of range management specialists particularly those who have furnished the information and much of the leadership in studying the problems of this no-man's land. Being foresters the profession of forestry has fallen heir to

professional responsibility for the problems of all so-called wild lands.

This may seem ambitious. But the forester must always be concerned with all lands which by cultivation or other use will at some later date be referred to him for reclamation by reforestation or otherwise. The forester is vitally interested in sub-marginal farm lands, lands on which is practiced suicidal agriculture. In this sense the forester extends his interest from mere timber growing to land management for the highest conservation of its organic resources.

The slogan "forestry must pay" has been affirmed so loudly that it was accepted without sufficient scrutiny as a guiding principle. But forestry goes beyond dividends from business enterprises built upon questionable bases. It is not necessary to express forestry in terms of present day business practice. It is recognized that there is urgent need for working out some plan to save from wreckage as much as possible of utilization enterprises. But such problems must not be permitted to dim the far objectives. They are an incident in forestry. Yes; forestry must pay in social values which are as enduring as civilization itself.

In the latter sense the domain of the forester extends beyond timber growing to land management. Important explorations of his duties and responsibilities are now being made.

The forester in this larger sense is dealing with the elements of physical environment of civilization. They are (1) climatic forces, (2) topography, (3) soil developmental processes, (4) biological forces, (5) plant succession, (6) flowing

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

water, (7) erosion and sedimentation. This formidable array of potentials represents the forester's laboratory than which there is none more fascinating. Out of this equipment he was formerly asked to produce fuel and timber. Now he is asked to maintain favorable conditions for the perpetuation of our civilization. These favorable conditions have to do chiefly with control and conservation of soil and water. Consideration of problems involving the control and regulation and conservation of water rightfully become the duty of the forester. Especially is this so since in most of western America the most valuable product from the mountainous areas is water. When water has values of \$100,000 per second foot of continuous flow as it has in southern California, management of watersheds primarily for water yield in maximum beneficial quantities becomes a mandatory objective for public lands.

BOUNDARIES OF APPLICATION OF FINDINGS

In the second place Director Forsling's paper refers to certain questions about which there is some confusion. In the absence of adequate experimental determinations and I may add—interpretations—findings under one combination of conditions have been assigned to other combinations of conditions. A specific example of this practice is the question of the role of forest vegetation in water conservation. The fact that forests return great quantities of moisture by transpiration to the atmosphere has been urged on one hand as favorable influences of forests, but on the other hand this function of the forest has been presented in regions of critical water supply as evidence against favorable influence of forest vegetation. How far is the transpiration loss of the forest a desirable character and how far

disadvantageous to water supply. A recent paper by Hoyt and Troxell² has opened up this question nationally. It becomes necessary, therefore, to determine the boundaries of various influences of the forest applicable to objectives of management for specific climatic and topographic localities.

There is not sufficient time to review here the paper on forests and streamflow by Hoyt and Troxell. Briefly, the paper opens up the question of the role of forest cover on summer flow of streams. It was found in the case of southern California that denudation of a forest cover by fire, increased rather than decreased the summer flow. The increase was at no time more than 4 per cent of the total flow, a figure less than the degree of accuracy which can be claimed for the stream gagings. The study can not be considered as complete or final, because of serious limitations in measurements of rainfall. One rain gage beyond the limits of either watershed under study within a region where wide variations in fall occur from place to place is certainly not sufficient to serve as basis on important conclusions. The question of summer flow has by no means been settled by this study; it has been merely opened formally. There is sufficient evidence, however, to indicate that the flood discharges and erosion were greatly augmented by the denudation of the Fish Creek watershed by fire.

Experiments which we have been carrying on in southern California have gone far enough to show that canyon bottom vegetation, consisting of alders, cottonwoods, willows and the like, which are sub-irrigated by summer flow transpire large quantities of water back into the atmosphere, sufficient in the case of Fish Creek to account for the increase in summer flow measured in the experiment re-

²Hoyt, W. G. and H. C. Troxell. Proceedings American Society of Civil Engineers, Vol. 58, No. 6. August, 1932.

ported by Hoyt and Troxell. Under California conditions the chaparral vegetation grows on drained slopes, and has at its disposal after the last rains of the winter rainy season only that water above the wilting point which is held by the soil against gravity. Hence fires will not release water from drained soils. Ground water drainage can only be increased from drained slope soils by reduction in draft by plants in the root zone. Since vegetation, sprouts and seedlings, has before it, following the winter season, a very long favorable growing season, it is probable that water in the soil is the only limiting factor to growth. Hence it can reasonably be expected under climatic conditions of California that soil water retained against gravity would be extracted by the end of the dry season. Neither size of plants nor their rate of transpiration can be considered of much importance. Increases in flow can be referred to reduction of transpiration by the sub-irrigated vegetation in the canyon bottoms rather than from the destruction by fire of the vegetation on drained slopes making up 90 per cent of the area.

Thus, the conclusion by Hoyt and Troxell cannot be considered applicable to the problem of watershed management over the Nation, nor in other regions where a different combination of conditions would produce different reactions.

But it must be recognized that forest vegetation where its roots have access to water of water tables will transpire large quantities of water. Thus as Dixey³ has concluded forests on mountain and hill slopes under drained conditions serve to effect control of flow and erosion, and this function may in most cases exceed the value of the water transpired. On the other hand forests on level lands or in sub-irrigated valleys may lose a quantity of water greater than their utility in the control of flow. It is important that it be

recognized that such a condition may exist, and that special studies be made to determine if it applies. When in doubt, or until such findings are made, certainly the safest procedure is to maintain the control of natural vegetation as far as it be possible.

MEASUREMENTS

Such boundary surveys involve measurements. Enlightened opinion of the influence of the forest has been subjected to cyclic rises and depressions. George Marsh following Becquerel, Lorenz von Libernau and others announced the dictum of the favorable influence of the forest. The classic example was the deterioration of Mediterranean regions following deforestation. But a school of climatologists who found climatic controls beyond limits of forest areas discounted the influence of the forest. Then there followed the papers by Vallés and Chittenden which directly questioned the claims long made for forests and on which many national policies were formulated. It was measurements, made it is true in inadequately planned and executed experiments on streamflow, that gave substance to objections to the former opinion. In the absence of measurements conclusions were the result of speculative reasoning.

In the past decade, however, more careful measurements have been made which establish certain influences of the forest beyond any shadow of doubt. And very important, it has been established that the burning of a landscape which formerly was protected by a complete covering of vegetation induces erosion of an order far accelerated beyond that existing when the mantle of vegetation was intact. With definite findings of this nature is furnished support and ground for enlarging the domain of the forester. The continued advance of conservation in man-

³Dixey, F. *Water Supply, A practical handbook.* xxviii pp. 571. 133 figures, London. 1931.

aging land for social values must rely upon reducing questions of degree of influence to measurement. Measurements, therefore, may be emphasized as the watchword in the era now dawning.

In closing, a statement by the brave and valiant explorer Amundsen is appropriate:

"Whatever remains to man unknown in this world of ours is by so much a burden on the spirits of all men. It remains a something that man has not yet conquered—a continuing evidence of his weakness, an unmet challenge of his mastery over nature. By the same token every mystery made plain, every unknown land explored, exalts the spirit of the whole human race—strengthens its courage and exalts its spirit permanently. The trail breaker is an indispensable ally of the spiritual values which advance and sustain civilization."

In connection with discussion of the Hoyt and Troxell paper I wish to refer to the baneful influence of the paper by Col. Chittenden, which occurred in the Transactions of the Society of Civil Engineers in 1909. Col. Chittenden's reasoning is shown to be fallacious, although he continues to be quoted in engineering works. His reference to the

influence of forest litter, that it is the chief agent of absorption by a forest cover is an outstanding fallacy. Curiously enough George Fillmore Swain, a Past President of the Society of Civil Engineers, in his Chester S. Lyman lecture series at Yale in 1914 presents a much more logical and plausible treatment of the influence of forest vegetation on streamflow. Swain is by far the better authority on the subject and oddly enough is quoted much less in engineering works on forests and streamflow.

In closing I want to show a few slides of the effects of a true cloudburst which occurred on September 30, 1932, in the Tehachapi Pass of California. The flood resulting from the cloudburst caused the loss of about two million dollars in property and the death of 32 persons. The area in general was seriously overgrazed. One remarkable fact shown in these slides is that where there had been left by accident a layer of leaf litter under trees, or where the natural bunchgrass sod had not been broken, no erosion had occurred. Alongside these remarkable areas, however, the ground bared by overgrazing was cut with labyrinths of gullies.

DISCUSSION

E. G. Dudley: It strikes me that this meeting in numbers is primarily a California meeting. It also struck me yesterday that the papers that were read or subjects which were brought up showed problems which should be very close to the heart of all Californians. Only two of the problems brought up yesterday, water and taxation, would be problems in which the people in general in this state would be interested in at this time. Of the two problems, the water problem is most important to every individual and industry of this state, and for that reason I want to reiterate at this meeting

the point of view which should be put over in this state in regard to the forester's idea of the use of forests for the storage, control and regulation of water. I would like to see that very distinctly impressed upon our members. As you know, we are intending to embark on a statewide water plan which will probably be the greatest thing of its kind in the United States today, involving an ultimate expenditure of over half a billion dollars. It has been very hard to put over the idea before the Legislature and Governor and Water Commission that one of the prime factors in the water problem is

in the present building of the plan so as to make sure that the plan will function in times to come and we will not have the problem of silting of dams mentioned in yesterday's paper. I wish to bring that point of view to all foresters in this room. I would like to see a copy of that paper sent to every member of the two commissions who have in the main been carrying out the development of this water plan.

Mr. Bates: I regret I wasn't here when this paper was being read. In reading over Forsling's paper and also in thinking of the plan that was presented by the California foresters—I believe it was called "The Place of Forestry in the State-wide Water Plan"—the point that occurs to me is that we are using the words "water conservation" in a way that may be misleading. To my mind that term implies the idea of saving and perhaps also of increasing. The word conservation does not necessarily mean increasing, but has this implication. Forsling says that the gross water yield may be smaller in some degree. It seems we have got to face the fact absolutely squarely that when you grow vegetation on a watershed there is going to be less water available for streamflow. Water permeates into the soil rather than to run off the surface. The main thing is the regulatory effect of vegetation. It seems to me we would be on much safer ground if we talked about "water regulation" and dropped the words "water conservation."

Mr. Cecil: In reference to the statement just made. Speaking for southern California, we are not so interested in the amount of water produced as in the production of usable water. The distinction in southern California is very strongly drawn with reference to watersheds that have been denuded by fire. The paper of Hoyt and Troxell referred to yesterday brought out that the summer flow was

greater on a watershed (Fish Canyon) where the vegetation had been destroyed by fire. But the water increase was not represented by usable water. By usable water in southern California we mean water devoid of silt load. It is impossible to use water that carries heavy silt. In southern California very little of the water for irrigation purposes is used and applied directly. Ninety per cent of water in southern California is water that is pumped from underground basins. Water that comes from the canyon goes into those underground basins. Water carrying heavy silt will not percolate and not only will not percolate but seals the gravels. Therefore a real distinction between amount of water and its usability. We insist that water must be usable. Merely the fact that there is more water does not mean that it is usable. Dr. Lowdermilk's per cent figures, taken in actual volume, would not irrigate one orange tree for one summer.

Dr. Lowdermilk: May I add two points particularly for the benefit of the people out of California? This matter that Cecil referred to in the storage of water in California involves somewhat more than is usually thought of as water conservation or regulation in the eastern part of the country. In the western states, and especially in California, we have peculiar geological formations set up for our water conservation storage and use. Our mountains were lifted up rapidly and the valleys are filled by material eroded out of these mountains. Flats in California usually are filled up former valleys or basins, and these filled basins of coarse detrital material, sometimes over 2,000 feet deep, furnish ideal storage basins. This keeps water pure, prevents its waste by evaporation or transpiration and makes water available wherever wells are put down for irrigation, without cost for construction of aqueducts and canals. The most economical means of utilizing our

water yield from the mountain areas is to put it underground. Particularly is this so because our rains come in winter. This past year we have not had any rain since April. In the long growing season we must depend upon stored water supply. The important thing is to get water underground, and as Mr. Cecil mentioned, we can not spread and sink water underground if it contains a large amount of sediment in suspension. Nor can we spread and sink water if it comes in a peak storm flow. Then we can only let it waste to the ocean, and once wasted to the ocean it is lost. Water here is worth \$20.00 per acre foot. It does not take a peak flow very long to cause a loss of one million dollars worth of water. One principal means of conservation of water in California, and perhaps to a less extent elsewhere, is to keep that water in such condition that we can sink it underground.

The other point that I want to make is this: It is granted that, under certain circumstances, by removing vegetation and thus removing the water lost by transpiration, we will get an increased summer flow. It is assumed when we impound 10 per cent of the rainfall that 90 per cent has been used by vegetation. The implication is that vegetation is using the 90 per cent of rain we didn't get. Realizing this

we published a paper, "Analysis of Factors Affecting the Yield of Water from Watersheds in Southern California," which is available to those interested. Evaporation takes a very large proportion and we have set up experimental installations to test the effectiveness of rainfall for penetration. We are finding that through three feet of soil we get only about 30 per cent of rainfall, even though the ground is bare. The rest is lost by direct evaporation. If our rainfall in California came in half-inch storms a week apart, on bare watersheds, we wouldn't get one drop of water in the underground basins. The water would wet the soil down to 3 or 4 inches and in a week's time be gone. On the other hand, if we got all of our rain in one storm that didn't exceed in hourly rate the percolating capacity of the soil we would get maximum yield. We do not get rain in the same way every year. It varies in amount and time. The way rain comes is perhaps the most important factor in conservation of water. Until we know the effect of the way rainfall comes and of the distribution of rains, on underground water yield, we are unable to determine the effect of the presence or absence of vegetation. Even if we denuded our watersheds completely, we would not get as much water as the differences indicated.



"At any event, history seems to show that many good things accomplished were preceded by an era of evangelism of some sort, by appeals to the emotion, and by imagination. Emotional appeal, no matter what its nature may be, does no more than start things going, it never finishes things up. . . . We may grow impatient, many may lose faith, but let us understand that there is a limit to all human capacity to get all things done at once."

Sinclair Wilson, in this issue.

THE PLACE OF RECREATION IN THE FOREST PROGRAM¹

By C. J. BUCK

Regional Forester, Portland, Oregon

Recreation is forcing itself more deeply into the forestry program. In Europe, from earliest times, it was the major forest use. To what extent recreation will control forest plans will depend on the broadness of the vision of foresters of today and tomorrow. The author points out some of the problems and conflicts this growing forest use thrusts upon the forest manager.

YOUR reaction to the title of this paper will depend on whether or not you are a confirmed kiln-dried, lumber-making forester.

In order to prevent confusion of thought, I would like first to broadly outline what is meant by recreation. The term as used here is not the billiard-playing, or primarily horseshoe-pitching or even the golf-game type. It has little of the "lounge lizard" flavor. It is rather the exercise-exhilarating type with highest moral development attributes. Rather a quest for space and for things that are calm, colorful, bright and restful; the thrills and exhilaration of the high mountains; the establishment of summer communities within the forest areas. This form of recreation means mental health as well as physical. It is thoroughly respectable and good for the human. Let us term it "forest recreation" as distinguished from other forms of outdoor recreation, such as golf.

Whether or not we will admit it, forest recreation is already in the forest program. Its share in moulding the program will vary widely under different conditions. The influence of recreation in the development of forest policy will inevitably be tremendous. This influence, however, will work more largely through the public management of forests than through the private. Recreation is a force

sufficient in itself to definitely determine and bring about public ownership and control over large forest areas. Even though there is no correlation between recreation and wood forestry, public ownership of certain large areas will be assured merely because of their recreation values.

In this connection, let us consider the history of public forestry in the United States and the part which recreation has played in the development of public ownership and control. Over a quarter of a century ago and within the reach of the experience of many of us, recreation begged for a place in public forest management. It knocked at the door and whenever its appeal was neither heard nor regarded by foresters, it took its own steps to divorce forestry from public land management by asserting to itself complete jurisdiction. Witness the fiasco of the beginnings of state forest management and of the development of forest schools in New York—a classic instance of the power of recreation to protect its interests. Here the lack of appreciation of the recreation values by the forest land managers led to the withdrawal of millions of acres of forest land from any utilization of the wood crops. It has been said by foresters themselves that probably the public action in this case was warranted because of the predominant recreation

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

values. A philosophical attitude was taken by foresters. Too much so possibly, considering the whole forestry situation and the benefits obtainable by the arousing of public interest in forestry through harmonizing and correlating it with recreation.

From a view of the situation in New York on the ground at the time, it appeared to me that failure to appreciate recreation values in highway timber borders was largely responsible for the discontent and disapproval of the system of cutting of wood crops. Withdrawal of dead timber and live from all forms of utilization such as took place here, is a step of no intrinsic value to recreation and is a distinct loss to forestry and to conservation. Just as the forester failed to appreciate recreation, so did the recreationist fail to appreciate forestry. First the forestry idea went wrong and then the recreation idea went wrong. Forestry and recreation both are included in the broad field of conservation, but with their divorcement, needless economic losses result. National forest administration has undergone the same experiences—losses in public support and in use of economic values on isolated areas have been the penalties paid for the lack of reasonable recreation appreciation. Increased growth of the national forest enterprise conversely has resulted from proper correlation of other activities with recreation, fish and game.

In other states fortunately, such as Pennsylvania, wholesome recreation has been recognized from the beginning as a major objective in a well balanced program of state forest administration.

Forestry's greatest problem has always been one of schematic leadership in the moulding of thought along the lines of greatest public weal as against community inclination. The horizon must be continuously searched for more light to strengthen that leadership.

The history of the progress of forestry in any country is largely one of a series of adaptations to various ownerships and social value concepts. The accomplishments in forestry have not always been due to a direct approach to a forestry objective as such. The earliest laws providing punishment for incendiarism in Central Europe came not from a desire to preserve a wood supply, but to preserve the feed for swine. Outdoor recreation is not a new influence in the forest but it is the very first major influence encountered in the history of European forestry. Even the idea of any control or private ownership of forests developed from the idea of regal rights to the chase. This arrogation of individual hunting rights over specific tracts was the first step away from the idea of general community ownership of the forests. The idea of conscious growing of wood or of forestry followed after centuries of game uses and regulation.

The recreation problem is now in the forests—the vastly increased development of transportation facilities and rapid mechanical transportation easily brings everyone into the depths of the mountain fastnesses. The greatly increased leisure which future civilization should bring will no doubt increase this back-to-nature tendency. National forest recreation visitors in 1931 were over 32 million on 160 million acres of land and the state park patronage now amounts to 45 million people on 3 million acres. The state parks furnish but an acre for every 15 people.

I suggest that we search a little way into one class of the underlying causes of the problems met with in the development of forestry, especially that set of problems having to do with human attitude and motivation, and appraise the value of forest recreation in those problems. All communities of the Celtic race supplied with great virgin timber wealth

have first fought the forest with the ax to make room for the plow and cultivation of the soil and have then continued wasteful destruction of the forest with fire.

The easiest, quickest and most effective tool in changing the soil cover has been and is, FIRE. There has been failure on the part of foresters to effectively combat these propensities. This common thought—the ingrained resultant of combating with nature in changing the soil cover from forest to edible products—not only has been but continues to be the greatest single deterrent to forest protection and timber growing in virgin timber communities. Napoleon Bonaparte was forced in retaliation to order burning at the stake as a penalty for incendiarism. Stringent laws are enacted in many countries to enforce protection of the great public property in forests. Today in America, sleuths are hired to apprehend and punish incendiaries; and today fire suppression at public expense has even extended itself into the realm of employment as a partial means, at least, of human subsistence—a doubly wasteful and extravagant economic process. Governmental fire protection plans often have just as completely outstripped the development of human thought as has the prohibition law in the 18th amendment to the Constitution of the United States. An advance in community attitude usually follows but does not precede wholesale and serious forest depletion—only after disastrous economic results are felt are attempts made to replace the timber growth at considerable public expense. Under these aggravated conditions which exist over areas bearing appreciable portions of our remaining virgin timber wealth, a search into the human attitude and for a means for its correction is absolutely compelling.

The people of the earth have failed customarily to appreciate and properly value the wood wealth. Always it has seemed, even upon general public con-

sideration which moulded thought, that forest conservation was for future generations. Never has it served as of sufficient avail against local community propensities for forest economists to logically demonstrate the case of public good. These underlying human propensities are just as real today in the rural communities of our states as they were rampant in Germany and France in the fifteenth and sixteenth centuries.

These propensities determine the attitude and predetermine great difficulties in prevention of destruction of forests by fire.

Right here let us recognize that recreation affords one opportunity for foresters to reach farther down into community life and thought—an exceedingly valuable opportunity. Already it is being used to varying extents in different states and communities. The public recreation contact is a ripe plum dropped into the forester's lap. Camping, picnicking, summer home establishment, hunting and fishing and tramping, and community developments dependent on recreational travel all are possible—but only if the forests are protected from fire. The one greatest enemy of forestry—FIRE—is here met directly, and the human propensity to use fire is brought into keen conflict with the other recognized human values. Encourage and develop recreational life and its concomitant businesses and public service enterprises, and when fire comes in spite of us, we have public indignation, assistance, and support for fire protection funds. To an extent, and often to a great extent, we have public support for fire control, and from fire control on, public concepts of sustained yield, values of watersheds for irrigation and power are attainable. With this sympathetic public contact established, foresters are furnished opportunities of reaching the ultimate in general public conceptions of forestry objectives. One approach into the field of recreation can thus well be made from

this angle of the moulding of public opinion, or change in basic community attitude.

Another approach is from the side of the greatest service which our forests may render to the people.

It would be platitudinous to remark exhaustively on the social values of forest recreation. It is sufficient for foresters to appreciate that recreation fits consistently into their basic conceptions of performance for the highest human welfare. The same spirit of public service and enthusiasm which forestry offers is basically due to forest recreation. Many foresters—I believe all foresters who have contacted and seriously studied this use of the forest—have become imbued with its extremely high social value. As a source of human development of good citizenship, of health, as a factor in decrease in crime, recreation reaches into fields of more direct humanistic values than does forestry of itself as a source of wood and water. In fact, a full appreciation of these values tends to lead foresters into doubts as to the highest value of forests. Pronouncements are forthcoming already that the greater value of the forests in general is as sources of recreation. Such pronouncements come from states and areas where general mass concentration of people in cities is relieved by visitations to the forests—the lakes and streams of Minnesota, Wisconsin and northern New York are examples. The ever-increasing, highly prized recreation values and uses and the public appreciation has seemed to some at first thought to outweigh the more slowly developing values in wood crops to come from vast cut-over and slowly re-establishing areas. However, the basic values of wood and water, and retention of soil placement, are too fundamental to our life on this earth to be replaced in great degree by other and incidental values however great they may become or to

whatever extent they may locally develop. But the fact that recreation foresters have difficulty in keeping their feet on the ground should at least lead all of us to appreciate its great public value.

There is also another psychological attitude for foresters to consider, namely, an inherent feeling of common ownership of the large spaces, mountains and forests of the earth.

Europeans tried for centuries to keep fish and game in private preserves. The edict of the government through the highest tribunal of the monarch proscribed private ownership. Even with social life well established as of high and low degree, the nobles had their difficulties—poaching was ever rampant even with proscription of the death penalty. An innate feeling of common ownership of fish and game permeated the minds of the lowly. It was a persistent force which, at the first opportunity in the development of equality among men, broke forth into gleesome and determined communal ownership. It is a force which cannot be brooked.

Akin to the feeling of proprietorship over fish and game which has resulted in sovereign control by the state, is another and similar one which interferes with absolute private control in land management. The mountains, the sea, the wild forested places—they are nature's solitudes—belong to all. They are a common right. Industry may pollute the very common air we breathe and it is borne with some patience, but the fish, game and wild life of the forests and rights to travel obscure paths into wildernesses are common rights not to be seriously abrogated and then only in the public but never in the private interest.

Foresters and forest owners must conceive of themselves as land managers formulating policies under the conditions which confront them. Holding fast to the

objectives of fire protection and further developments of selective logging and sustained yield, they will succeed best when they harmonize their management with the very basic public interest of recreation.

Forestry of itself faces obstacles in attacking the recreation problem. And first among these I am inclined to place the attitude of foresters themselves. Accustomed to planning merely for forestry per se, we are faced with an interfering element — an element of land use which forces itself forward for recognition.

The difficulties faced by foresters in this respect are largely those caused by a lack of educational balance. Forest managers in the beginning of European forestry were game managers and managers of pasturage for stock. Game work in this country is of comparatively little interest to the forester of today. Something of a revolution is needed in this attitude. We need to see through different eyes and those eyes must not be blurred with visions of European forestry formulae or with the economic value of timber crops.

A tree is beautiful. A beautiful tree on a shaded woodland path near a concentration point of forest recreation seekers may be predominantly valuable for recreation—to look at. But to the forester, should this tree be classified as overmature and stag-topped, it is not beautiful. In fact, its very presence on the ground is a disgrace to competent forestry practice since it should have been removed long ago—in fact immediately upon attainment of its period of highest financial return. The beauty of a tree to the forester depends upon its age, size, habit of growth and to the degree in which it approaches maximum annual productivity in wood. This is all because he sees with the forester's eyes. To a logger the trees look somewhat differently as logging costs and lumber values are engraved on his retina as he looks.

When a farmer, a real estate agent, a

geologist and a landscape gardener, or scene painter, look at a suburban pasture, they see totally different things. One sees the soil productivity in terms of beets and onions; one sees possible subdivisions into town lots; one sees the origin and age and character of the rock formation and one sees an enchanting view or a bit of scenery. Each of these men sees with different eyes as developed by his training. Public forest land managers must secure the appreciation of nature's visual offerings. They must learn to see the things which the recreation seekers so highly value. They will then be patient if timber crops are not harvested in the decade when ripe financially or silviculturally but are yielding high special recreational values.

An eminent American paleontologist recently told me that he spent a month in studying the beauty of Lake Como, not in appreciation of that beauty which Virgil sang about so long ago, but in analyzing its underlying causes. This student is a scientist—a scientist needless to say of eminence in several sciences—a scientist who has developed several pairs of understanding eyes—an authority on many subjects.

Only as the forester develops the recreation pair of eyes will the union of forestry and recreation come to pass. Instead of the recreation forester being considered a separate entity of some unusual development along recreation lines, the need of the country and forestry is for every forester to possess an appreciation and understanding of recreation.

Granted that forest recreation should be promoted willingly and sympathetically, just what is to be done about it? Just as in the consideration of all forms of land use, the customary recommendation is in order. Make a survey and classification. Surveys and classification will be very valuable, but their value will depend largely upon the farsightedness and cor-

rectness of the conceptions upon which they are based. The attack on the recreation angle of land use must be based on some plan embracing both the demands of various kinds of service and the means to be employed in meeting such demands. One conclusion should be drawn at once, viz., forest recreation, generally speaking, can be properly provided for as a by-product of forests and without serious interference with timber growing. Forest recreation is an outlet from restricted park areas to immense forest tracts and as such can go on over large areas without general and serious embarrassment to forest productivity. It is so recognized throughout Europe, and in some of our heavily used recreation states.

Our concept of the recreation-service system should embrace the national, state and local parks. The more spectacular objects of topography, such as greater mountain masses and other supreme masterpieces of nature's work, must be inviolate of private interference with complete public control and individual enjoyment. Such are cared for as national lands or national parks, an established public policy in North America as well as in European countries. With the development of general automobile transportation, state parks have been found to be needed. The public needs in this field of national, state and county parks must be met and the lands involved must be publicly owned. None of them need cover the broader forest recreational requirements except incidentally. Forest recreation to a limited extent may be practiced and even catered to in such parks, as fishing, mountain climbing and even trail trips of comparatively short duration enjoyed. Although the development of state parks is proceeding to an increasing extent along natural instead of artificial modes of treatment, still the expansive forest is needed for the longer, untrammelled, more unregulated sojourns, for camping, hunting, fishing, solitudes, spirit

of adventure or whatnot; the closer touch with nature in its untouched manifestations, the kind of outdoor recreation I am here calling forest recreation. It includes vacation homes in the forest in small communities with their attendant community developments and camping and picnicking and roaming on a holiday.

In a sense, forest recreation is an expansion of the national and state park system into rural areas. Any survey into recreational uses must necessarily be based on present and future demand and supply. Demand will vary tremendously depending upon basic factors of population, tolerability of climatic conditions under which it lives, routes of travel—existing and proposed—into forested districts, amount of leisure enjoyed by the people and the existence of competing attractions. Considerable light into these factors can be obtained from a study of the existing use. The present disposition of the people will give a fair insight into public valuation of the various forms of local forest recreation. Opinions of relative recreation values may be derived from observation of existing local appreciation, use and development tendencies.

Natural beauty, attractiveness and usability are all associated in those values. For any form of intensive development, water is usually involved. Whether seashore or mountain streams or lake, scenic values among livable comfortable surroundings usually develop in a combination of forests and waters. The more extensive forms of use, as hiking, mountain-climbing, fishing and hunting, depend rather directly upon the demand and the existence and attractiveness of these values of a broader and more expansive type.

The survey, for instance, of state forest recreation resources will first determine the existence of any superior natural or local state attractions of a park order. Certain selected beauty spots should be promoted as national or state or county responsibilities. With this determination

made, the classification should develop further the valuation of the more common and usual forms of forest recreation. Where timber properties are invaded by heavily used transportation routes, classification of values along those routes can be readily determined upon field survey. Difficulties are usually quickly encountered here in the form of scenic values in trees of themselves. Economic values in stumpage on certain areas will have to be weighed against the public scenic values. Reservation of timber border strips for scenic purposes is obviously a public function and logically a state or county function. The forest owner soon finds that logging along the highways is not an industrial enterprise of merit in the community but rather is a ruthless process of removing the trees and despoiling local beauties. It is indicated, therefore, that the forest owner should associate himself coöperatively with local recreation committees in working out these problems. Patience and sympathy are here warranted in the usual case where the owner desires to obtain public respect and coöperation in the forestry enterprise. In some cases private lumber companies have donated small timber bodies at public insistence; in many cases the states and federal government through the Forest Service have reserved certain more valuable areas and dedicated them to the beauty of the forest highway.

Another point must be referred to here. The often suggested policy of practicing forestry cuttings in byways or highways where the public can see and appreciate that forestry does not despoil but really improves the forest. Under many conditions such a policy would be based upon lack of scenic appreciation and recreation understanding. The forester with his marking ax must build upon the confidence of the public. This means largely the recreation public. This confidence must develop from sympathetic understanding of a brotherhood of recreation

interests. The forester must be trustworthy and trusted before he can gain the confidence upon which he will build educational work in forestry principles.

Listing of the forest recreation values of a tract will oftentimes disclose values in fishing, camping and picnicking along important routes of travel. Here exists an opportunity for fire protection measures. The lingering opinion that transportation arteries mean fires and necessarily increased fire losses must be changed. The development of state and national forest systems of coöordinated use of recreation resources will demonstrate that under proper planning and attention, fire control is positively assisted. The problem, however, of the traveler, the camper, the recreation seeker must be met by guiding his activities. Among the greatest of these possibilities is that of concentration of campers by the establishment of sanitary and attractive camp grounds, education and regulation through contact by the local fire guard. Further, the speed of action and effectiveness in fire discovery and suppression are greatly enhanced through use of rapid transportation.

This regulation of the public from the fire standpoint actually produces a specific atmosphere of realization of the traveler's responsibilities to the forest owner and to the forest wealth when he enters the forest area. This is a result of no mean value and is a result which has followed through the above processes on large areas within the national forests. The extension of a similar attitude to all forest tracts is a need of today in fire protection.

The forest recreation plans require provisions for the following:

1. Highway and trail picnic and camping areas, either free or with a small charge.

2. Intensive recreation development areas including summer homes and the various facilities and utilities required by forest recreation community developments. The latter would include furnishing of sup-

plies and of local recreation facilities.

3. A sympathetic or correlated treatment of economic values of wood utilization, water development, grazing and other resources, upon areas devoted or to be devoted to considerable recreation use. This would include reservation of timber at some points, restriction of grazing, prohibition of water development where recreation values predominate, and a planning of the transportation system with development of scenic and recreation values considered.

4. Promotion of fish and game propagation and their wise use.

5. Recognition of the recreation values in a limited number of pleasurable high mountain areas of low economic value in timber where mountain climbing, and isolated wilderness sojourns may be enjoyed.

In the more detailed recreation planning we enter fields of landscape architecture. Landscape architecture has been defined as merely fitting the ground for human use and doing it in such a way that it gives pleasure by reason of its beauty and convenience. In applying landscape architecture to the forests we should, I believe, go a step further and apply landscape architecture only and strictly under that subdivision called the natural system. This means natural or local growth or expression. The natural expression is the most economical to use, it is easily preserved and it is most suitable and aesthetically adapted to the preservation of forest beauties. Location of forest roads, trails and state highways often afford notable possibilities of developing scenic views and beautiful utilities. An understanding of these basic principles should now be developed in the educational opportunities of all foresters.

Sound forest recreation plans will not be predicated upon a wholesale encouragement of recreation activities regardless of other considerations. Plans for the development of recreation will contemplate the establishment of recreation fa-

cilities under a basic belief in the value of correlation. The fundamental values of wood products and their preservation will determine a recreation development consistent with that use and preservation, exceptions being entertained only where recreation economic values are predominant. The recreation plans, therefore, will be tied into logging transportation plans, fire protection plans, highway development plans and plans for re-establishment of forest growth. In other words, complete correlation with development, harvesting and major uses of the forest should be the objective.

Take fire protection as an example of an activity where recreation must be correlated. In such a case, recreation should be encouraged and facilities established on areas of low hazard and comparative ease of suppression. Through establishment of facilities and correlation of uses, concentration would thus be secured under the best obtainable conditions for fire control. Conversely, areas of great hazard would be omitted from plans of recreation development and where advisable, human use restricted or even excluded during periods of hazard. State laws authorizing closures to human entrance are now in effect in some states. In case of logging plans, need for exercise of foresight in establishing recreation uses along main arteries to be later developed for transportation of wood products would be indicated.

In conclusion, I will express the belief that recreation will force its way into the forest program. To what extent will depend on the broadness of vision of the foresters of today and tomorrow. A frank admission of the possibility of new economic concepts will help. Coördination of land uses in advance of public demand is the cornerstone on which to build. Right today in the public consciousness, recreation is the leaven which leavens the bread of public control over large forest areas.

COMMENTS¹

By J. D. COFFMAN

National Park Service, Berkeley, California

WHEN Dr. Meinecke asked me to pinch hit as discussion leader in the absence of Mr. Morse I thought it might seem strange that one specializing in fire protection should be called upon to discuss a paper on recreation, but after hearing Mr. Buck's exposition of the close relationship between fire protection and forest recreation I see that Dr. Meinecke's request was logical, as usual. Furthermore, there is no subject closer to my heart nor one which I would take greater delight in discussing than that of forest recreation.

Mr. Buck has presented an admirable paper and I doubt if anyone present will seriously challenge the fundamentals of forest recreation he has outlined, even though there might be individual differences of opinion as to the details of local application.

I think that Mr. Buck hit upon a happy and very pertinent fact when he stated that a realization by the public of its responsibility for the protection of timber values and scenic beauty in forested areas will lead to a decrease in the number of man-caused fires. I attribute the comparatively small number of man-caused fires in the national parks to this very thing and believe that the same principle will apply more generally to national forests, state parks and other forested areas of recreational use when the general public realizes that those areas are to be permanently managed in such a way as to preserve these scenic values for the general public. The preservation of timber screens along roads is an important factor in this matter, and I am glad of the emphasis placed on the protection of roadside beauty.

In this connection I want to say that Mr. Buck personally has had a large part in preserving the beauty of one of the outstanding scenic highways of the United States, the Stephen T. Mather Memorial Highway through the Rainier National Forest and Mount Rainier National Park. The Forest Service is to be highly commended for the generous coöperation given in the establishment of this splendid memorial to the founder of the National Park Service.

Last summer I fortunately had the pleasure of sitting in during a conference between an Assistant Regional Forester from Denver and the Superintendent of Yellowstone National Park at which correlation of measures for the preservation of roadside beauty along the new Cook City highway into Yellowstone National Park was discussed. The Assistant Regional Forester stated it would be the policy of the Forest Service to administer this scenic approach road through the national forest in the same manner as in the park, so that there should be no difference in character of treatment of the roadside on the two sides of an artificial line. Correlation of principles and unity of purpose such as this certainly tend to develop the best kind of coöperation between the two Services.

I am glad to see emphasis placed on appreciation of forest landscaping. Up to the present time foresters as a general rule have largely failed to give this the consideration which it deserves and demands. I think it is high time that as a professional group we recognize that lack in the past and give greater attention to it in future.

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

If I may be permitted to use a personal experience as a homely example it will serve to indicate how we may have failed to appreciate some of the principles of forest landscaping as seen through the eyes of a landscape architect.

As a member of the Forest Service here in California I took great pride in the fine fire lookout houses we were accustomed to build, which were painted a solid white. It was a pleasure to point to these white spots on the tops of various peaks and ridges and call the attention of forest visitors to these eyes of the forest protection system. The more visible they were, the better. When I transferred to the Park Service I very naturally carried my ideas and these lookout house plans along with me, and when the money was available for building a lookout house in Glacier National Park a similar structure was erected and likewise painted white and was very evident from the vicinity of the park entrance. When I next saw the landscape architect for that particular park I inquired with pride if he had seen our new lookout house, and you can imagine how taken back I was at his reply: "See it? Why the d - - - thing stands out like a sore thumb!"

Shortly thereafter the disastrous Half Moon fire of 1929 removed the offending lookout house from the landscape, along with a lot of timber. When the house was rebuilt it was stained a brown color, in accordance with the recommendations of the Landscape Division, so as to merge as unobtrusively as possible with its surroundings. Our Landscape Division has also taken the lookout house plans, and by reducing the slope of the roof, extending the eaves, and making a few other touches, has vastly improved the appearance of our lookout houses. Where it has been possible to put extra expense into a few of these buildings because of their valuable tie-in with our educational work in situations where the lookout house is

visited by a large number of tourists, a number of very excellent lookout structures have been the result. The finest example of these combined fire lookout and contact stations is that of the Watchman, at the rim of Crater Lake. This particular location involved special treatment, for we had recommended a much needed lookout which would show on the sky line in a very scenic area, to which there was some opposition. In order to overcome that objection the landscape architect drew up plans for a structure that would fit in with its surroundings as nearly as possible, and the result is what I consider the finest fire lookout building anywhere in the United States.

I am not advocating that the Forest Service or the states should build expensive lookout houses or that all such structures should be painted brown or green, for I thoroughly realize that in many locations, especially where lookout houses are used by smokechasers for backsighting, or for orientation by airplane observers scouting for fires, white buildings may be desirable or essential. I do, however, want to suggest that the next time you have occasion to travel in a highly scenic forested area and see an unpainted galvanized iron roof heliographing the sun's rays for miles around, or unpainted galvanized iron latrines in an otherwise attractive public camp site, or hard and fast standard color schemes applied without reference to location or surroundings, you ask yourself whether these things meet the ideals and demands of forest landscaping, and whether both utility and harmony can not be taken into account.

Mr. Buck has well said that different pictures are presented to different individuals by the same scene. As an illustration in my own experience, when I first visited a roadside clean-up area within a national park I was quite surprised to find that while all the down stuff was carefully disposed of, many standing dead

trees were left along the roadside. I inquired why, for to a forester a snag is a potential torch for the dissemination of sparks and brands to the opposite side of the road in case of fire. I learned that to a landscape architect those dead trees form a picturesque part of the landscape picture, while to them an artificial stump visible from the road is as much an abomination as the dead tree was to me from the standpoint of fire hazard. As a result of exchange of ideas, respect for each other's viewpoint has developed; today the snags are removed in roadside clean-up work in the parks and the stumps are either cut so low that they do not obtrude themselves upon the visitor, or else are removed through the aid of tractors. Thus both landscaping and forest protection are served.

Mr. Buck stated that game work in this country is of comparatively little interest to the foresters of today. I doubt if it is so much the lack of interest as it is the lack of opportunity for instruction in the important subject of wild life management. I feel that foresters today have too little opportunity in schools to gain the information and training they should have in this subject. To the best of my knowledge only one forest school offers opportunity for a thorough course in this subject. I believe it is one of the subjects which should be given greater prominence in the preparation of professional foresters.

Mr. Buck mentioned educational balance. Three things I believe should be included in a forester's curriculum in order to secure proper educational balance for an all-around forester, namely (1) training in wild life management; (2) appreciation of forest landscaping; and (3) instruction in forest recreation.

The establishment of a profession of recreational administration needs recognition. The National Park Service believes that such a profession of park or recreational administration is already an actual-

ity and would like to see a few outstanding schools provide appropriate combinations of courses adequate for training in this line. Personally I believe that such training can be tied in best with forestry schools.

It may interest you to know that the park superintendents at their conference last April went on record as in favor of professionalizing the National Park Service organization. Our ranger examination in the past has not had as high a standard of requirement as the Junior Forester examination, but we hope in the future it will be raised to a similar standard but not limited alone to those majoring in forestry but also open to candidates who have majored in biology, geology, archaeology and other subjects pertinent to Park Service administration.

Personality and assurance that public contacts will result in reaction favorable to the Service represented are important considerations for those choosing recreational work as a professional activity. If one does not find public contacts a pleasure or is not of the character or personality that will create favorable impressions in his contacts with the public he should not enter into recreational management but should choose some other line of endeavor.

Mr. Buck has stated that a determination of recreational values can readily be made. If in that statement he means to include scenic or esthetic values I have grave doubts whether such determination can readily be made. This question has arisen in connection with fire trespass cases and we have been unable to find literature or authorities on this subject that would permit of such values for forest scenery as such being introduced into court. A real basis for such determination would be of great value, and this subject is one well worth consideration by foresters.

The question of trespass upon unfenced

private timber lands is a moot one in California today, and probably in many other states as well. In this connection I wish to call attention to the following statement in Mr. Buck's paper, with which I heartily concur:

"Industry may pollute the very common air we breathe and it is borne with some patience, but the fish, game and wild life of the forests and rights to travel obscure paths into wildernesses are common rights not to be seriously abrogated and then only in the public but never in private interest."

The question of charges for recreational privileges was touched upon very briefly by Mr. Buck. This question was also discussed somewhat by Professor Baker yesterday. In a recent issue of the Service Letter of the Pennsylvania Department of Forests and Waters this subject is discussed in an article entitled "Making State Forests Pay Their Own Way." In that article the statement is made "The National Park Service has set a precedent in charging admission fees to the national

parks." In the statement of national park policies, however, recently prepared by the Hon. Louis C. Crampton and included in the recently issued Report of the Director of the National Park Service, the following recommendation occurs: "National park administration should seek primarily the benefit and enjoyment of the people rather than financial gain and such enjoyment should be free to the people without vexatious admission charges and other fees."

To this recommendation I personally heartily subscribe, but at the same time there are those in the National Park Service who feel that a reasonable admission fee is desirable.

Even if it were an accepted principle that no fees should be charged by the national parks, there may be other considerations to take into account in the case of state, county and metropolitan parks which might make such charges necessary or desirable there.



"The only possible owner of land for which there is no profitable form of use is the public. No one will permanently hold and pay taxes on land that has no present or prospective value. Our American assumption has been that, as the Nation grew, private initiative would find ways to make land profitable. It has not reckoned with the possibility that private enterprise might operate to rob the land of its usefulness and then abandon it, worthless, to the public again. Neither has it reckoned with the possibility that declining requirements for land use might become a cause of extensive land abandonment. Now, with contracting agricultural requirements for land and with a rapidly increasing accumulation of cut-over forest lands that, in their present condition, offer little incentive to continued private holding, we are faced with a very disconcerting prospect. Very large compulsory increases of public holdings through tax delinquency and title forfeiture seem inescapable."

From *Forestry in a New Era*, by R. Y. Stuart, in this issue.

THE PLACE OF RECREATION IN THE FOREST PROGRAM¹

By C. B. MORSE

Assistant Regional Forester, U. S. Forest Service, Ogden, Utah

Recreation uses came to the forests uninvited, but they have come to stay and give the forester an opportunity to give a real service and by it gain public approbation for his work in general. Mr. Morse calls attention to the physical values of recreation areas aside from the inspirational and educational values, and that the social and economic returns to the community justify an aggressive policy for developing and using forest recreational resources. A number of suggestions are enumerated for guiding the preparation of plans for developing recreational areas and for coordinating recreation and other uses.

I WILL say first that recreation has taken its place in the forest program of the United States. Recreation came to the forests uninvited by the timber foresters but it came. It is in the forests and the open country to stay. It is a blessing that it has come to stay—to recreationists and to foresters alike.

Within the short history of the United States we have seen a remarkable transformation of man's relation to the out-of-doors. Hunting and fishing are no longer necessary as a means of securing food but are prized sports. Women, once in long flowing skirts assigned and resigned to household duties, now participate largely in out-of-door sports. When this country harbors an urban population greater than today's total population, we will need a lot more out-of-door space for recreation.

Out-of-door life seems to be making an ever-increasingly potent appeal to the American people. The changing habits of the people who live in urban communities have strongly influenced the demand for both nearby and distant recreational areas and more and more people are using the forested and open areas each year.

Economic changes are occurring rapidly. No one, of course, can foresee what the outcome will be. Apparently we are now going through the throes of changing to a shorter work day and shorter work

week. This seems inevitable on account of the developments in mechanical lines with immensely greater production of food, clothing, and all of the necessities, comforts, and luxuries of life per man-days labor. The wonderful advance in transportation, speed and comfort through the railroad train, automobile, and airplane together with the good roads and landing fields in every part of the country is followed by an ever increasing and more insistent demand for the use of our forested areas and big open spaces for recreation.

The entire land area of the United States is 1,903 million acres. The potential uses of this land area have been classified in Table 1.

Less than half of the 973,000,000 acres listed as possible crop land was actually used for the production of crops in 1919.

Now let us glance at Table 2 which gives the areas now set aside for recreation purposes including camping, scenery, fish, game and bird refuges, etc.

It will be seen from this table that nearly 10 per cent of the entire land area of the United States is now under some form of withdrawal under which it is either set aside definitely and specifically for recreation purposes or, as on the national forests, recreational use is recognized as one of the major uses. There

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TABLE 1

POTENTIAL USES OF LAND AREA OF THE U. S.

	<i>Acres</i>
Crops (extreme physical possibility)	973,000,000
Arid grazing land	468,000,000
Forest only (incidental grazing).....	262,000,000
Pasture or forest (not in forest at present)	66,000,000
Cities, roads, railroads, farmsteads, etc.	67,000,000
Waste (absolute desert, rock, etc.).....	67,000,000

seems to be no question of doubt, therefore, that recreation has assumed a very large and important place in the use of our wild lands.

There are indications that we may need to restrict our crop land, retiring unprofitable or submarginal areas in order to reduce the volume of crop production and eliminate financial losses due to the attempts to utilize unprofitable lands and in order to favor land which can earn an economic return under existing conditions. It is entirely within the bounds of possibility that such marginal lands as may be retired from crop production will find their highest use for out-of-door recreation. At any rate it is safe to say that a lot of such lands will be used for out-of-door recreation whether it pays a money return for such use or not.

There is no unit of measurement for land of scenic beauty. Such places are rarely capitalized in such a way as to be assigned a money value. As a matter of fact, the area of lands having scenic beauty is of little significance. Further than this, it is impracticable to isolate the lands having recreational value. The scenic effect produced by barren, rocky peaks or by non-timbered rolling grass-land may be as fully appreciated as a forested mountainside. In general, all forest lands have recreational values. The recreational values of forest and open lands are relative. In a hot dry desert country, narrow canyon bottoms with scattered scrub oak, maple, and aspen are

highly prized. Yet, if the same areas were found in a heavily forested region where streams and lakes are abundant they would have little or no recreational value.

I sometimes think we are inclined to overstate the spiritual and moral values of out-of-door areas and overlook the fact that such areas have a very real physical value to mankind. I think it is true that we should have out-of-door recreation for the purpose of communing with nature and thinking big thoughts but I am very sure that we must have recreation areas in the open where it is cool to which people from the cities and towns and hot desert valleys can go for their physical wellbeing and comfort. There is no way to measure the value of some of the mountain canyons just out of Las Vegas, Nevada, which the Forest Service is improving for recreational purposes. For scenic beauty these areas have little in comparison with Yosemite or Grand Canyon or the Yellowstone. There are no lakes, no streams to fish in, just water enough for domestic uses. In fact, the water is piped to the camp sites from a spring. The timber is nothing compared with any commercial stand. It is just up in the mountains and *cool* but no one can know how these recreation areas are ap-

TABLE 2

AREAS SET ASIDE FOR RECREATION

	<i>Acres</i>
National parks	7,753,861
National monuments	2,885,058
National military parks	14,430
72 federal game and bird refuges (administered by Biological Survey)	500,000
2 in Alaska (administered by Bureau of Fisheries)	500,000
12 federal game refuges in national forests	2,000,000
State parks	2,750,000
State forests	1,750,000
Total	20,153,349
National forests (not inc. in above)	159,360,691
Grand Total	179,514,040

preciated who has not spent days and nights on a southern Nevada desert.

Few of our recreation areas are not in great demand for other uses. Water power, irrigation, lumber, grazing, and other commercial interests have little sympathy with or understanding of the need of or reasons for devoting considerable areas to purely recreational use. On the other hand, recreationists, as such, have no more sympathy or understanding of the point of view of the commercial interests. Certainly we do not need to set aside all of our out-of-door areas or forest lands and wild lands for recreational and game use, nor do we need to set aside all of our national forests for timber, grazing, water power, and irrigation uses. We can and must correlate the uses for commercial purposes and for recreation on the national forests and state forests. Timber cutting and grazing have received black eyes because of failure to recognize the communities' interests in recreation. By the same token recreation and game protection have received black eyes on account of failure to recognize the necessity, justice and economy as well as investments of the operations of the lumbermen, graziers, and other commercial interests. There is a way by which all conflicting interests can live and let live. The correlation of the various conflicting interests is one of the most important and most interesting phases of the work on the national forests. Constructive farsighted planning is the solution of the conflicts which we have had so much of in the past.

Recreation is paying its way not so much in the direct rentals for use of the land but in money spent in the communities in or adjacent to recreation areas. Over four billion dollars are being spent annually by recreation seekers, hunters, fishermen and tourists in the United States. Over 30 million people annually visit the national forests alone not to

mention the number of visitors to the national and state parks and other forest recreational areas. In some of the northern states recreation is the second largest industry. A report of the New England Council for 1926-27-28-29 states: "The economic importance of recreation to New England is evident in the fact that in one New England community of 25,000 population the taxes paid by summer home residents exceeded \$600,000 annually." In its news letter of November 19, 1931, the New England Council states: "New England's annual income from recreational sources amounts to \$500,000,000 and if this is considered as a six per cent return on a capital investment it would place the current economic value of New England's recreational assets at about eight and one-third billion dollars. The value of the recreational property in New England is placed at \$550,000,000 and taxes amounting to \$15,000,000 are paid on this property."

In a study of the deer hunting in the fall of 1932 on the Fishlake National Forest, it was found that \$34 was spent by hunters for each buck killed. To handle this ever increasing number of recreationists who are visiting the parks, forests, and other areas annually, to protect the resources and furnish the necessary sanitation and comforts for the visitors, requires money, men, recreational improvements and roads.

Both the social and economic returns to the community and nation at large justify the adoption of an aggressive policy for the development and use of forest recreational resources. The carrying out of this policy is a responsibility of the forestry profession, since recreation uses must be correlated with other uses now under its supervision. Planning of recreational use is needed to get the best thought into the development and should provide for the following:

1. Determination of the areas which

should be managed primarily for recreation.

2. Withdrawal from private acquisition, such of these areas as should be retained in public ownership.

3. Classification of recreation areas according to most suitable type of use such as public campground, resort, summer home, primitive area, etc., with definite planning of each type of use.

4. Classification of lakes as to the recreation and scenic values, reserving from reservoiring those of high value for recreation. In some cases the lake may be used for both reservoir and recreation by limiting the high and low water line so as not to injure the natural beauty of the shore line.

5. Reservation of miniature but accessible primitive areas of from 40 to 100 or even 1,000 acres which are within walking distance of camps and highways. Ninety per cent of the public visiting the forests can walk a quarter of a mile and enjoy these little wilderness areas, but not over 1 per cent of the public visiting the forests can ever afford or be in a position to take pack horse trips into the very inaccessible and mammoth primitive areas of a quarter million acres or more.

6. Extension of road and trail systems needed to make recreation resources accessible and more attention to recreation values in locating all roads.

7. Improvement of public campgrounds with simple conveniences and safe sanitation. New designs for campground improvements are needed, making them more attractive. These camps should be maintained not once a month, but daily. Regardless of the attractiveness and luxuriousness of improvements, if they are not maintained they cannot be kept respectable.

8. Control of pests, such as dust nuisance, mosquitoes, ants, rodents, flies, yel-

low-jackets, poison ivy, bark beetles, etc., at camps. This requires much study.

9. Preservation of campgrounds. They are deteriorating rapidly. This is going to require considerable effort and possibly some research.

10. Regular and dependable patrol, not only to maintain and protect recreational resources, but to encourage use and direct it along educational and cultural lines. The public should be taught to see beauty, not only in virgin timber but in a well-cared for stand whose products are being harvested and put to use; not only in unutilized grasses and weeds but in the conversion of forage into meat. The public should be trained so that their recreational tastes will appreciate intelligent use as well as the hoarding of resources.

11. "Don'ts" and irritating restrictions should be replaced by the creation of the spirit of proprietorship in forest resources so that the individual himself will want to preserve these resources for himself and others.

12. Camping should not be confined to concentration areas. The forester should provide also for those families and small groups who prefer seclusion rather than congested campgrounds.

13. Preservation and improvement of the roadside beauty, making a scenic strip plan, for all roads with recreation values. Making man's struggle for profit and desire to advertise subservient to beauty and subservient to the forester's desire to give the roadside the appearance of a well kept forest.

14. Development of guiding principles for designing buildings, boat landings and other structures which will enhance the beauty of recreation areas.

15. Encouragement of private parties to develop such resorts and other facilities as are needed by the public, with emphasis on respectable types and adequate public service.

16. More attention should be given to stocking streams with fish and to having big game and birds in the vicinity of recreational areas so that campers can get occasional glimpses of wild life.

Foresters should cater more to use of game for sport as well as for spectacle and there is no need of any conflict between these two types of uses as they can go hand in hand. Game is not only to look at but to hunt as well. Big game as a spectacle will not be impaired in the least by well regulated hunting.

17. The policy of the foresters should not be to *let the public use* the forest, but to *encourage them to do so* and to direct this use so it will be educational and inspirational as well as enjoyable.

18. Economic studies are needed to show the financial returns to communities from tourists and local travel brought about by the development of recreational resources. Undoubtedly the future of many communities depends almost en-

tirely upon their ability to stimulate recreational travel and supply these travelers with food, clothing and other accessories.

CONCLUSIONS

Any governmental agency, industry or public utility, would welcome the opportunity the forestry profession has to gain approbation of the public by conducting a service that meets with such a ready response.

As stated in the beginning, out-of-door recreation is *in* the forests. It is going to stay; it will greatly increase; it brings its problems and its blessings. The forestry profession has always been in the vanguard looking for new opportunities. Recreation is the big opportunity of foresters today of which there can be no doubt they will take advantage. It is up to us to get ahead of the game and not let it get ahead of us.



"Traditional conceptions of selective cutting do not mix well with traditional conceptions of northwestern logging equipment and methods of operation. But a re-examination of both is developing ways and means of selection by areas, selection by machine settings, selection by groups or patches of timber, and even — in connection with tractor logging—tree by tree selection. . . . Obviously, the kind of selective logging we are trying out in the Pacific Northwest is not inspiring by forestry. But obviously also, it should prove of material aid in bringing the industry more rapidly to a degree of stability where commercial forestry will become possible. It should shorten the time of hurried liquidation. It should increase the returns from liquidation. It should at the same time, through the volume of timber left in initial logging, create a greater incentive to hold and carry cut-over lands, a greater interest in the possibilities of future cutting, and physical conditions on the land more favorable to complete restocking."

From *The Outlook for Timber Management by Private Owners*,
by W. B. Greeley, in this issue.

THE OUTLOOK FOR TIMBER MANAGEMENT BY PRIVATE OWNERS¹

By W. B. GREELEY

Secretary-Manager, West Coast Lumbermen's Association, Seattle, Wash.

In the Pacific Northwest there are two opposing influences that affect the possibility of forestry practice on private lands. Soil and climatic factors favor a rapid rate of growth and quick recuperation of logged-off lands. Against this is a force for liquidation that, until its power is spent, will defer the stable conditions necessary to permit any general or serious undertaking of long-time forest management. This article contains some plain talk from a man who has had the best opportunities to see both the academic side of forestry and the realities. He reiterates his faith in the ultimate practice of forestry on private lands but has no delusion of its early accomplishment. His reasons are definitely and frankly stated. Mr. Greeley's paper is followed by comments of Mr. D. T. Mason.

THE viewpoints offered in this paper are based primarily upon the conditions existing in the Pacific Northwest. They are offered with no abatement whatever of the writer's faith in the ultimate adoption of the principles of forest management on substantial portions of the timber-growing land in private ownership; but with the purpose of recognizing plainly the cold facts of the situation.

It must be admitted that probably at no time since forestry has received serious consideration in the United States has the situation of forest industries been so chaotic or the future of private forest ownership so uncertain as at the present time. The owner of western timber, indeed, is faced with a complex of uncertainties.

What markets will forest products command in the revolutionary changes that have already taken place and are still under way in the building and consuming practices of the country?

What values can be assigned to timber—either old growth or the new crop—at any future period?

What will be the tax costs chargeable against such future timber values as may be realized?

What risks of loss from fire, insects, disease or other natural causes must be set off against the timber values that may

be marked up as attainable at any given time?

Forest growing, or long-time forest management, like any other business undertaking must be based upon definite calculations or assumptions as to investment, costs, risks and realization. Under the conditions of recent years in the Pacific Northwest, these essential factors in determining whether or not timber growing can be successfully undertaken are very largely matters of guess work. It is impossible for any one to set these factors down and develop from them a business forecast that would meet even the most moderate requirements of sound accountancy or pass the scrutiny of an investment expert.

This, of course, is just another way of saying that the present situation of forest-using industries in the Northwest is still far removed from the *degree of stability* necessary to setting up long-time business undertakings in land investment and timber-growing costs. But few of the developments actually taking place in this direction have the character of definite or assured business enterprises. In the great majority of instances, cut-over lands are being held either in deference to public opinion or because of other values or

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

considerations than future timber growth or while the owner waits for clearer vision into the future.

The reforestation acts of Oregon and Washington, with their moderate basis of taxing logged-off and second-growth areas, have somewhat checked the trend toward tax delinquency of cut-over land and have somewhat encouraged the policy of holding and waiting. While an important and fundamental step in stabilizing the business of timber growing, they can not be said as yet to have brought about any substantial change in the attitude of forest owners toward the uncertainties of the future.

Meantime, protection from forest fires carries on under the settled policies of compulsory owner participation in Oregon and Washington. The insecurity of forest property in climatic periods of exceptional hazard was again demonstrated by the very destructive fires in old-growth timber in western Oregon last fall, causing a property loss probably greater than any occurring in that state within the past twenty years. However, on the cut-over lands of the Pacific Northwest as a whole, the young growth of various ages appears to be more than holding its own. The recent surveys and studies of the Forest Service have indicated larger quantities of merchantable second growth and larger areas of restocking land than had previously been accurately determined.

In other words, while the economic factors in commercial forestry remain clouded and uncertain, the reproductive processes of Mother Nature—aided by fire protection that is efficient except in the face of occasional climatic catastrophes—go steadily on.

And, while depressions may come and go, land ownership may change, and the best laid schemes of mice and men gang a-gley—we are witnessing on the private lands of the Pacific Northwest the same

natural renewal and perpetuation of forest growth that we have already seen in older sections of the United States. When and as economic conditions reach a sufficient degree of stability to justify plan-wise, commercial forestry, there will be a substantial physical basis of second growth and restocking lands to work with and to build upon.

While the unstable economic conditions long antedated the existing depression, the experience of forest industries in the Pacific Northwest during the past three years has necessarily greatly aggravated them and added much to the uncertainty which befogs our future. I would like to cite an illustration, quite outside the well-known factors of decreased consumption of forest products, greatly reduced prices, and operating losses in the lumber industry. One of the most promising developments in the Pacific Northwest of comparatively recent years, in relation to permanency of forest land management and economic returns from timber growth, has been the rapid development of our wood pulp industry. At almost every point it has contributed constructive elements to the situation tending toward economic stability. It has created markets and values for pulping woods of low value for lumber products. It has provided a substantial market for mill wastes, both as pulping chips and hogged fuel. It has started to create a market for logging waste. It has established limited markets for small forest wood of the pulping species, opening up the possibility of farm forestry and forest thinnings. It has even exemplified to a substantial degree the forester's ideal of balanced and co-ordinated utilization, with the same hemlock log going partly into lumber and partly into pulp in accordance with the relative economic value of the "clear" and "common" types of wood. It has, with the prospect of early returns from the harvesting of small material, created

much keener practical interest on the part of forest owners in the possibilities of second growth and sustained yield.

But today, as an aspect of the worldwide depression, the wood pulp industry of the Northwest has received a knock-out blow from the greatly increased competition of foreign pulps, admitted into the United States without tariff protection and produced under debased foreign currencies, at a reduction of 30 per cent or more under their normal price in American money. Until this new element of instability can be rectified, the promising possibilities of the pulp industry to northwestern forest management must be heavily discounted if not eliminated.

I do not wish to over-emphasize the effect of the depression upon the instability and uncertainty of the forest situation in the Northwest. It has, of course, affected many other industries and many other sections of our national economic structure in the same way. We must, if we have any faith in the virility and capacity for adjustment of American institutions, look beyond the depression in endeavoring to appraise future trends and prospects in commercial forestry.

The instability in the forest situation of the Pacific Northwest arises primarily from causes which long antedate the depression period in time and will also extend materially beyond its hoped-for early termination. It arises primarily from the basic fact that the Pacific Northwest is still and must for a considerable time remain in the economic stage of liquidating investments in virgin timber and facilities for its conversion. The exigencies of liquidation of burdensome investments, enhanced by a burdensome and almost confiscatory method of taxation, control timber and lumber values in this region and, hence, dominate industry thinking and industry planning. The industry must, as an economic evolution, get this liquidating stage substantially behind it before

we can reasonably expect a degree of stability sufficient to permit any general or serious undertaking of long-time forest management.

I do not need to repeat here the details of the situation in the Pacific Northwest, commonly described as "over-production," or its effects. The data presented to the U. S. Timber Conservation Board in 1930 estimated the privately-owned timber in the Douglas fir region of western Oregon and Washington at 347 billion board feet. If it were all convertible, it would represent thirty-five years' supply at the cutting rate prior to the depression. Substantial portions of it are not convertible—even at pre-depression log values; but there it all stands—on the tax rolls and in the capital account ledgers of its owners.

Our investigation showed an actual investment in this timber and in sawmills, logging facilities and other capital requirements for its conversion of over \$800,000,000, or more than \$80 per thousand board feet of the lumber cut by the industry in its banner year. The current carrying costs for actual interest, taxes on timber lands and facilities, insurance and other non-escapable charges were nearly \$3 per thousand board feet on the highest yearly cut of lumber yet made.

When to these factors are added a stationary or declining trend in stumpage values over a considerable period of years and a steadily rising trend in tax cost, it will be readily appreciated what a tremendous pressure for the liquidation of investments, for converting trees in to dollars, runs through the entire Douglas fir industry. It is the source of unwarranted and untimely production, of demoralized markets, of wasteful utilization, of haste to be through and done with it—of economic thinking and economic policy, in a word, which are precisely the opposite of forestry. I must confess that I can see small chance for a substantial under-

taking of commercial timber growing as a business enterprise until this stage of liquidation has sufficiently run its course and attendant features of public policy have been sufficiently adjusted, to bring about a fair degree of stability in carrying costs, product realization and stumpage values.

It may thus be said that we have in the Pacific Northwest two opposing conditions:

First, on the *physical* side, natural advantages in rate of growth and variety of products, together with a substantial actual regrowth on cut-over lands, which unquestionably will—sooner or later—afford a physical basis for commercial forestry.

Second, on the *economic* side, a motive force for liquidation that—until its power is at least partially spent—will defer the stable conditions necessary to timber growing or permanent land management as an organized business undertaking.

Our actual progress in and toward commercial forestry, however, need and should not wait until this blind and largely destructive force for liquidation has spent itself. A good deal can be done to *gear down* the power of this motor into a more orderly and restrained process and ultimately merge the liquidation of old-growth timber into nature's provision of new growth timber, under forms of management that may approach if they do not attain the ideal of a sustained yield. Having frankly disclosed the difficult aspects of the situation, I would now like to mention some of the constructive possibilities that will have a part in bringing this change about.

In the first place, the second growth resources of the region are undeniably responding to organized fire protection.

In the second place, both Oregon and Washington have good and fundamentally sound laws concerning the taxation of cut-over lands and new forest growth. It

is yet too early for these laws to exert a pronounced influence for long-time forest land management; but their trend is in that direction and they will powerfully augment any favorable developments in the economic situation.

The third factor which should be mentioned is the more receptive attitude on the part of the public toward a change—over a reasonable period of graduated adjustment—from *ad valorem* to yield taxes on present stands of merchantable timber; or toward a partial deferment of *ad valorem* taxes until time of cutting, which would have the same general effect upon long-time forest enterprises as the yield tax. We are still a long way short of positive accomplishment in this direction; but it is worthy of note that, for the first time in the history of the Pacific Northwest, public sentiment at least appears ready to seriously study the problem of timber taxation and to consider adjustments of tax methods that would materially relieve the pressure from this source for quick liquidation.

A fourth constructive development that should be enumerated is the growing interest in the Douglas fir region and the increasing application, in one form or another, of selective logging. I mean, of course, economic selection, designed to avoid loss in operating unprofitable timber and to liquidate property investments in the way that will best pay out.

No small part of the ills of northwestern lumbering have been due to the lengths to which it has been carried by its own genius for powerful machinery, low unit costs and mass production. Too often, this has led to the logging and manufacture of raw material which did not pay its way. Far too often, it has glutted our mills and markets with surpluses of low-grade lumber, which not only have demoralized the prices received for such items but have often carried down with them the prices of higher-

grade and normally profitable items. Far too often these conceptions of clean-sweep logging and mass utilization have thrown into the red the liquidation of timber properties which would have been profitable under a judicious selection of the raw material harvested.

Traditional conceptions of selective cutting do not mix well with traditional conceptions of northwestern logging equipment and methods of operation. But a re-examination of both is developing ways and means of selection by areas, selection by machine settings, selection by groups or patches of timber, and even—in connection with tractor logging—tree by tree selection.

While still in its infancy, this new development in northwestern logging promises, by eliminating at least a part of the unprofitable material, to greatly aid the problem of liquidation. A study of one property, for example, showed that, after accounting for all costs of logging installation and operation, the most money will be realized by cutting approximately 55 per cent of the total stand of timber.

Obviously, the kind of selective logging we are trying out in the Pacific Northwest is not inspired by forestry. But obviously also, it should prove of material aid in bringing the industry more rapidly to a degree of stability where commercial forestry will become possible. It should shorten the time of hurried liquidation. It should increase the returns from liquidation. It should somewhat relieve the weight of over-production upon the industry. It should at the same time, through the volume of timber left in initial logging, create a greater incentive to hold and carry cut-over lands, a greater interest in the possibilities of future cutting, and physical conditions on the land more favorable to complete restocking.

Many other things have an important place in the progress of northwestern forest industries toward a more stable foot-

ing, including improvements in lumber products, better merchandising and more effective development of markets. I pass over them to touch upon another factor of primary importance: namely, the relation of the public timber holdings in this region to the stability of the industries.

Approximately 38 per cent of the standing timber in the Douglas fir region is in federal ownership, mainly in national forests. This large proportion of government-owned timber necessarily is a factor of major significance in working out the destinies of the forest industries and in their progress toward commercial forestry.

The presence of the national forests and the activities of the Forest Service have had many beneficial effects upon the industrial situation, as in the development of organized fire protection and the technique of protection methods, in many contributions to good logging practice through the methods developed in public timber sales, in silvicultural and economic research, in the investigative and coöperative work of the Forest Products Laboratory.

A substantial gain was made in the constructive relationship of public timber lands to the industrial situation through the clarification, or confirmation, of the conservative policy in the disposal of timber—with a view to avoiding any augmentation of the destructive effects of private timber liquidation.

There are two additional lines along which, in my judgment, the national forest policy may wisely be developed to aid the stabilization of the forest industries and the opportunities for industrial forestry.

The first is along lines already initiated by the Forest Service in some instances, particularly in California, and recommended to the Timber Conservation Board by Major D. T. Mason. This is, as I would put it, the working out of coöperative plans for forest management, cover-

ing natural units or practical economic units of federal and intermingled or adjacent private lands. The ideal scope of such coöperation would be to put into effect a sustained yield unit covering the government and private forest lands within logical boundaries. The forms of coöperation practicably possible may not permit attaining completely the goal of sustained yield on the private acres. They may admit only of introducing a constructive form of selective logging or the carrying of lands for a second cut.

I do not believe it possible to yet outline any complete or full-blown policy for dealing with such situations. Like the great majority of things now written into the regulations and policies of the national forests, a plan of this kind must be developed case by case. The picture I have in mind is simply that where national timber holdings are so located as to have an important bearing upon the possibilities for sustained yield or some other scheme of long-term management on private timber lands, such possibilities will be carefully studied by the Forest Service. What can be done *in that particular situation* toward longer operating life of private timber or better conservation of forest-growing resources on private land? If the desirable and practical thing can be done consistently with public policy and legal limitations, well and good. A peg will be driven at that point. I believe it possible for enough of such pegs to be driven at different points in and around the national forests of the western states to materially help in the difficult task of getting our industries upon a more stable footing and headed toward commercial forestry.

The second suggestion I have in mind has to do with the enlargement of the national forests by purchase or exchange. Let me say with emphasis that this broad question should not be approached from the standpoint of relieving private owners

of losing or burdensome investments. The primary purpose of enlarged national ownership should be to aid more effectively in stabilizing the chaotic forest situation of the United States. Acquisitions should be made where they will accomplish the greatest good in that direction.

In stating this objective, I have in mind as of first importance the maintenance of essential regional and national growing stocks, as insurance against the difficulties and uncertainties now surrounding private forest management. I also have in mind provision for the custody and protection of tax-delinquent lands, or forest lands which by whatever process of classification or segregation are earmarked as incapable of successful forest management under private auspices. I have in mind logical consolidations of existing national forests, which among other benefits would enable the government to carry out more effectively its own policies of sustained yield and the conservative marketing of stumpage so as to avoid over-production. I have in mind larger opportunities for the national government to interest the management of private forest lands, along the lines just discussed, in the direction of greater permanency and stability. I have in mind that any program for the substantial enlargement of the national forests would necessarily transfer into government ownership some portion of the standing timber now privately owned; and to that extent would reduce the level of water in the reservoir and ease the pressure for liquidation with its attendant evils of over-production and chaotic economic conditions.

It would be out of place in this paper to attempt any detailed exposition of a desirable program of national forest extension. I refer to it here; first, because I believe it to be inevitable in the western states as our problems of forest land use and forest economics are worked out; and

second, because it can materially hasten the day when our northwestern situation will become sufficiently stabilized to usher in commercial forestry.

Obviously, we have a long and difficult road to reach this point. We can anticipate no sudden or revolutionary changes in present conditions that will clear the way for commercial forestry at a few strokes. We must rather look for a

gradual evolution, to which many different factors will contribute. It is not a time for foresters to lose their faith or relax their efforts, in the face of immediate difficulties. We should rather put our shoulders behind every constructive possibility, in an admittedly hard situation, even if its direct scope and promise are limited; and look to the results in the long run.

COMMENTS¹

By DAVID T. MASON

Manager, Western Pine Association, Portland, Oregon

I AM closely in agreement with what Colonel Greeley says in his paper; I wish to emphasize the main points which he makes and to elaborate upon some of them.

Colonel Greeley points out the desperate situation of private forest ownership, and the uncertainty of timber values. Based upon an expected shortage of timber which has not materialized, these values have greatly exceeded values which would have been justified by the realization from conversion over any substantial length of time. A deflation of these values is now taking place; no one knows how far this shrinkage is going, or how far it ought to go.

Colonel Greeley points out tax delinquency, which is developing not only in the Northwest but in California as well. The uncertainty of losses is pointed out, the uncertainty of future markets, the uncertainty of future realization, the forced liquidation of timber resulting in overproduction, the uncertainty whether the rate of liquidation can be controlled. The world-wide economic crisis clearly involves the lumber industry; it should be

recognized that forestry, although perhaps less clearly, is also definitely involved.

A few figures will indicate the depth of the crisis in the lumber industry. The gross income from the sale of the products of the western pine industry during 1932 is expected to be about one-fourth as much as the similar gross income in 1929; in both the Douglas fir and the southern pine industries the 1932 gross income is expected to be only about one-sixth as much as in 1929, and 1929 was not a good year in the lumber industry. With this very small income the lumber industry must survive and exist as best it can.

Interest charges have increased since 1929, with much of them in default; tax levies are about the same, but with much forced tax delinquency; some other overhead charges have decreased but little. Consequently, after deducting these fixed charges (so far as they are being paid) from the small 1932 gross income, the remainder available for wages and salaries is extremely small. Many men are entirely out of work and part time is the rule for those who still have jobs.

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

As the result of this increasing financial demoralization, the industry has been forced to discontinue much of such forestry practice as involved cash outlay; this applies especially to the planting of young trees and to the purchase of second growth. However, expenditures for fire protection have been effectively maintained. Blister rust protection has been maintained to some extent. Insect protection has been continued, though probably not as thoroughly as in earlier years.

While forestry measures involving expense have been only partly maintained, there are other measures mentioned by Colonel Greeley for which the economic situation is pressing more strongly than ever before. I refer especially to economic selective logging, and to sustained-yield forest management.

It has come to be generally recognized that over-production in the lumber industry is (1) a primary cause of the desperate situation in which the industry now finds itself, and (2) a most serious hindrance to the practice of forestry throughout the country. Some of our most important private forest land owners now recognize: that, without production control, over-production may continue for decades, and so long as continued will

keep values low and unstable; that control of production to be effective in the long run must be applied to timber rather than to sawmills; that control of timber cutting must be applied both to public and to private timber, and especially in the West coöperatively to these two classes of timber; that the form and basis for control of timber cutting must be acceptable to the public; that sustained-yield forest management is a form of control completely in the public interest as well as effectively in the private forest ownership interest. The Western Pine Association, with which I am connected, adopted last summer a program which fully recognizes this point of view.

The uncontrolled flood of forest products pouring from the virgin timber lands of the West is the most serious factor in the plight of the lumber industry; it is also the most serious hindrance to the practice of forestry. This uncontrolled flood is the most serious problem of both lumbermen and foresters. Sustained yield management is the most practicable measure of flood control. The need for coöperation of lumbermen and foresters in applying this control is obvious. The need is very great and the time is ripe for such coöperation.



"If the wheels of industry at large are going to shorten the working hours of men, or if we have recurring periods of depression in the future, we are going to have idle men. By placing them at work in our timber, we will have accomplished much more for them than if we stood them in a bread line, and we will have accomplished much more for ourselves than if we spend our gold, resulting largely from the conversion of natural resources, on non-productive public works."

Sinclair Wilson, in this issue.



BRIEFER ARTICLES AND NOTES



NEW MEXICO MAY NOW EXCHANGE ITS FOREST LANDS

Constitutional Amendment No. 1 which was submitted to the electorate November 8 was passed by a substantial majority. The vote for the amendment was 37,575 and 16,349 against.

The passage of this amendment will now permit the state of New Mexico, if it desires, to exchange its state school and institutional lands located within the national forests of New Mexico for an equal value, but greater acreage of public domain grazing lands.

In all, the state has approximately 338,000 acres of such lands. These lands are scattered widely throughout the national forests and in their present condition bring in but very little revenue to the state. The grazing lands are too badly scattered for desirable leasing and much of the timber land is in localities far removed from market so there is very little opportunity for the sale of timber. These lands are therefore, largely a frozen asset as far as income is concerned. By exchanging them for an equal value but greater acreage of public domain grazing lands the state can lease them immediately to derive a continuous income from them. Furthermore, it will enable the state to consolidate many of its present grazing units to better advantage to the people and to stockmen.

On the whole, it is believed, that this exchange will be extremely advantageous to the state and will enable it to secure an immediate income for the schools and institutions concerned. From the Forest Service standpoint it is largely a matter

of consolidation which will enable the Service to administer its lands more effectively and with practically no additional expense. Since much of the state land is heavily timbered it will also simplify forest management plans with reference to sustained yields.



MORE FOREST LAND DONATED TO IDAHO FORESTRY SCHOOL

Announcement was made on October 13th by C. L. Billings, president of the Forest Development Co., Lewiston, Idaho, that his company has donated 3,646 acres of forest land to the school of forestry of the University of Idaho. The area lies on Moscow Mountain in Latah County, Idaho, and increases the area available to the school for experimental purposes to about 10,000 acres, including a small section on another part of Moscow Mountain and a large tract near Emida used under special permit from the U. S. Forest Service. The new tract lies 18 miles from Moscow, the seat of the school. The grantors in a letter to President M. G. Neale and Dean F. G. Miller said:

"This company has decided to convey to the University of Idaho, by outright gift, about 3,600 acres of forest land on Moscow mountain. It is our thought that your forest school, which is easily among the leaders in the nation, should have substantial recognition from Idaho lumbermen and forest land owners as is involved in a gift of this kind. And it is our further thought that the area should be used as an experimental station as long as there is a forest school at the university.

"The area is reasonably compact. All

age classes of all species of timber common to the northern part of Idaho are found on almost every possible exposure. The timber has only been partially removed and slash from logging operations has been handled in various manners with various results. All in all, we think that there is here, remarkably close to your campus, a forest laboratory of very considerable educational value.

"We enclose warranty deed for the area with no reservations except that of oil and mineral which this company does not own. Taxes and fire assessments for 1932 and prior years will be paid in full.

"While we do not wish to encumber your title with reservations of one kind and another, we wish to ask for as liberal treatment of nearby bona fide residents in grazing and fuel wood privileges as is consistent with good forest management.

"Our people are happy to give the University of Idaho school of forestry under Dean Miller's able leadership this well-deserved recognition, and it is our hope that this land of ours may serve as a nucleus for further gifts which will in time provide a university forest of considerable size."

The Forest Development Company, which is a Weyerhaeuser subsidiary and was organized several months ago, is described on page 757 of the October, 1932, number of this JOURNAL.

The JOURNAL OF FORESTRY congratulates the Idaho School of Forestry and its able Dean on their good fortune in receiving this very essential piece of teaching and research equipment, and commends the donors for their interest and generosity. A forestry school should have forest laboratories just as it has laboratories within the walls of its buildings. In no other way can the teaching staff as a whole ordinarily obtain intimate and first-hand knowledge of the problems that confront the management of forest lands for the continuous production of timber. These problems as they arise have the tendency to direct the research effort to actual rather than academic problems. A school forest, furthermore, gives opportunity to carry on student forestry work according to a plan and in a way that is of permanent and increasing usefulness. American forestry schools with several exemplary exceptions, were slow in grasping the need of owning or otherwise controlling a piece of forestry property. At European and Japanese forestry schools a school forest is an outstanding feature in school activity. Only a very few of the leading American forestry schools are still without school forests.



REVIEWS



Der Frostkern der Rotbuche ("Frost-heart" in Beech—*Fagus silvatica* L.). By Jahn. *Zeitschrift für forst- und Jagdwesen*, No. 8, August, 1931, 15 pages, 1 fig., 6 plates.

The occurrence of "frost-heart" in red beech first came to notice in the fall of 1929 when the dying of beech in Westphalia was investigated. This phenomenon is distinguished from red heart, with which it is often confused in scientific literature, in that it is lighter and grayer in color, and has a pronounced dark border which is lacking in the other. The characteristic color of frost-heart shows up only after the wood is exposed to the air. As contrasted with heart-rot, frost-heart always arises in the middle of the stem, or at least, encloses the center of the stem, while the rot may be eccentric or even isolated in the sap-wood. Anatomically, the dark border zone is characterized by strongly developed tyloses principally within the rays. Frost-heart is most pronounced in the lower stem sections and in some cases is recognizable in the roots. It is confined entirely to the main stem. Young trees are not affected. The capacity for its development is apparently restricted to trees above 60 to 80 years of age.

The theory which considers the phenomenon as an outgrowth of red heart finds little or doubtful support. Investigations have also established that there is no connection between frost-heart and frost injury to the bark or twigs. The only tenable theory accounts for its occurrence as due to cold weather irritation of the bark of older stems. Recent investigations (Vandavelde, 1895) have shown that

beech responds to each and every temperature decrease by a change in sugar concentration, which is more or less proportional to the degree of coldness. During extraordinarily cold weather, the cells, not only of the bark, but also to some extent of the medullary rays and wood parenchyma, are saturated with glucose. Such over concentration of sugar is associated with another phenomenon, namely that of anthocyanin formation (autumn leaf red) which is frequently found to occur in plants growing in cold and arctic-like climates.

The development of tyloses is the result of the contact of the irritation induced by excessive cold with an inner obstacle, which is intimately associated with the decreasing vitality of the cells of the inner parenchyma, due to necrobiotic processes. The formation of these tyloses involves an oxidation of the cell contents, in which enzymes are active. During excessively cold weather, hydrolyzing enzymes, with oxidizing enzymes, press inward until they contact the dying protoplast in the cells of the heartwood and complete their destruction. Depending upon the severity of the reaction, young cells become involved in the process, until the reaction arrives in a zone where living cells prevent any further spread by energetic tyloses development. In other words, the centripetal effect of the cold is counteracted by the centrifugal effect of the inner stimuli. The stimuli which are responsible for frost-heart development are the same which give rise to fungus heart or heart rot, but the reaction is much more acute and rapid.

So far as the simultaneous occurrence of frost-heart and fungus heart is con-

cerned, fungus heart in the sapwood checks the development of frost-heart, but when occurring in the heartwood zone, it facilitates its development.

The reason for the widespread occurrence of frost-heart in 1929 may be attributed both to the extraordinary character of the winter, as well as to peculiar characters of the beech. The winter of 1928-1929 was characterized by protracted cold weather. December and January, the chief period of bud dormancy, were especially cold. By the end of January, the trees were already in a post-dormant state, during which, under certain conditions, the mobilization of reserve materials incident to the starting of growth is accomplished. February, the coldest month of all, was clear and dry. This circumstance, taken in connection with the singular habit of beech to sprout and mobilize its reserve food only under the influence of the actinic light rays, set the stage for the development of frost-heart, since the effect of the light stimulus on the buds is correlated with the mobilization of the cambium in the stem.

From a practical standpoint, frost-heart wood is very susceptible to decay. When freshly exposed, it is much more quickly covered with fungus growth than is sapwood. This is not due to any physical differences involving moisture content, but to chemical differences, since fungi find in the frost-heart the material which facilitates their development. Red heart is likewise more readily attacked than is sapwood, but less quickly than is frost-heart. It may be concluded that the latter is less thoroughly impregnated than is red heart with protective substances, which discourage the development of fungus rots. The ordinary fungi which bring about decay in beech wood, such as *Stereum purpureum*, however, are not involved, but other species (*Polyporus radiatus*, *Graphium*) find conditions in the dead wood of frost-heart favorable for their rapid spread. The danger of decay,

which is always serious in beech, is enhanced by the presence of frost-heart. A fairly lengthy bibliography is appended.

J. ROESER, JR.,

Rocky Mountain Experiment Forest.



Das Holz der forstlich wichtigsten Bäume Mitteleuropas (The Wood of the Most Important Forest Trees of Middle Europe). By H. P. Brown, A. J. Panshin, M. Seeger and R. Trendelenburg. Pp. 23 + 40 plates. M. & H. Schaper. Hannover, Germany, 1932. 7.50 Marks (about \$1.80).

It begins to look like Germany has to come to America for help in working up some of her forest information. This book, the senior author of which is one of the leading wood technologists of the United States, and at least two of the co-authors his former students, is really a pictorial atlas of the principal woods of middle Europe amplified by brief descriptive text and a key for their identification. The key is simple, being based on the structural characteristics of the cross section as seen with the hand lens or naked eye. The plates measure 4 by 6 inches and represent cross sections. Some European-grown American species like white pine, Douglas fir, black locust and red oak, are included, while in the appendix are cross-section cuts of 5 species well known in Europe only as imported lumber.

The photographic portion of the book much resembles Dr. Brown's *Atlas of the Commercial Woods of the United States*.

The binding of this little book deserves particular mention—heavy cloth and firm sewing. Why can't American bookbinders turn out such an attractive and meticulously neat job instead of the weak, cheap-looking sloppy ones we have to put up with? If the famous American high wage scale deprives us of craftsmanlike work, it

isn't justified. Note the low price of this book.

EMANUEL FRITZ,
University of California.



Plans d'Aménagement des Forêts
(Forest Management Plans). Bel-
gique, France, Hongrie, Suisse,
Province de Québec (Volume I).
Institut International D'Agriculture.
Rome. Pp. 250. 1932. 20 liras.

This volume is the first of a series dealing with the forest management plans of various countries; it contains practical examples of such plans, drawn up according to official regulations. The publication has been issued pursuant to a resolution adopted by the 1st International Congress of Silviculture held in Rome in 1926 at the International Institute of Agriculture.

The volume contains for Belgium, France and Hungary a statement of the legislation which requires forests to be managed according to plan. It also gives the text of official regulations relative to management and the revision of plans, as well as the specimen plans which form part of these regulations.

For Hungary there are presented the official regulations dealing with the demarcation and assessment of private forest properties, and examples of management plans which are used in that country for large and small forests respectively.

Both the national and the cantonal legislation are dealt with in the section on Switzerland, as well as the regulations laid down for forest management by the federal authority as a guide for the preparation of cantonal instructions dealing with the management of public forests. The instructions prepared by the Canton of Vaud are included as an example.

Finally, there is given an outline of the official memorandum dealing with forest management in Quebec, as well as other

forms used in connection with the forests of that province.

Perusal of the volume gives the reader to understand that the International Institute of Agriculture intends to continue the series of which this publication is the first, and to deal similarly with the forest management plans of other countries.

P. M. BARR,
University of California.



A Practical Handbook of Water Supply. By Frank Dixey, Director of Geological Survey, Nyasaland, Pa. xxviii+571. 133 Fig. and 6 maps. Thomas Murby & Co., London. 1931.

Written for conditions in central and east Africa this admirable work will have especial interest for those interested in water supply problems in arid to semi-arid regions. Particularly is this true in view of the author's statement "In most countries areas in which water is easily obtainable have already been occupied. As population increases it becomes more and more difficult to find naturally watered land." This work has particular interest for foresters in the discussions of the relation of forest and other vegetation cover to conservation and supply of water, to be found in Chapters 1, 2 and 4. Destruction of African "bush" by clearing for cultivation, by promiscuous burning and over-grazing with trampling is credited with causing excessive erosion, increasing run-off with consequent reduction in percolation and loss of ground water. Shifting cultivation in hilly districts by natives is denuding tracts of sufficient size so as seriously to affect the regimen of water flows. The remedy is stated to be forest conservation, and the formation of forest reserves, which will be available for production of timber and fuel, but whose main function would be "the maintenance of water supplies for both the present and

uture generations." Such a pronouncement by the chief of the Geological Survey in Africa excites lively interest in contrary conclusions reached by Hoyt and Troxell.¹

Of the complex factors affecting the flow in streams, condition of the coverage of vegetation as it controls surface conditions is given prominent place in influencing water supply. With loss of forest cover in the hills slopes become barren and scoured, which tends to the impoverishment of a country and a general drying up of the highlands. In confirmation of this conclusion the finding of a Commission appointed in 1920 by the government of the Union of South Africa to inquire into best methods of avoiding drought has special interest. "An important finding of the Commission was that one of the main causes of drought conditions is the destruction of vegetation which leads to erosion of the soil and thus to a diminishing efficiency in the rainfall." Evidence is not convincing that Africa is at the present time undergoing general desiccation although fluctuations in lake levels would indicate cyclic variations. There is "ample evidence" however, that efficiency of the rainfall for water supply is decreasing with increased denudation of the hill country with consequent reduced absorptive characters of soils.

Silting of storage reservoirs is stressed as a serious damage to water supply resulting from denudation of catchment areas.

Losses due to evaporation and transpiration by vegetation are fully recognized. Fast growing species of trees make heavy drafts upon water supply. Especially is this true in level lands, where ground waters may be reached by roots. In this respect a distinct difference in the desirability of a forest cover is made. Forest cover in hill country increases absorption, increases efficiency of rainfall, prevents ex-

cessive erosion and generally favors water conservation. On the contrary forest growth in level valley land diminishes the ground water supply in ratio to the characteristics by species for rapid growth and heavy transpiration. Emphasis on this distinction in the function in forest cover in water conservation appears fully justified and may well call into question the general idea that all forest growth favors water conservation for beneficial use. But to quote, "Consideration of the above factors (affecting water supply) will show that the whole problem of the effect of forests on water supply is an exceedingly complicated one. It is not one that admits of regional study, but it can be studied only in relation to particular localities." (P. 168.) This draining action of forests also has its beneficial effect in certain localities like the Landes (France) and in the Uganda swamps (Africa) in drying up swamps.

Other chapters treat of ground water supply, its occurrence, quality of water, water finding methods, recovery of ground water which have more local application and hence a less general interest.

The work is amply supported by citations to other works and will prove of interest to foresters, irrigationists and water supply geologists.

W. C. LOWDERMILK,

California Forest Experiment Station.



Some East African Coniferae and Leguminosae. By L. Chalk, J. Burt Davy and H. E. Desch. *Forest trees and timbers of the British Empire. I. Pp. 68, Plates 10, Line cuts 11. Bibliography. Imperial Forestry Institute, Oxford. 1932. \$1.75.*

This the first of a series of publications designed to describe the trees and

¹Hoyt, W. G., and H. C. Troxell. Forests and streamflow. Proceedings Am. Soc. Civil Engr. Vol. 8. No. 6. August, 1932.

the woods of the British Empire, edited by Chalk and Davy. The aim seems to be to summarize all the available information on each species. Director R. S. Troup of the Imperial Forestry Institute, in the preface, calls attention to the importance of "dealing simultaneously with the systematy of the tree and the anatomical structure of the wood."

Fifteen species are included in this bulletin and the information is classified under the following headings: Common names; Vernacular names; Botanical names; Systematy; Botanical description; Distribution; Climatic conditions; Vegetation type; Soils; Regeneration and afforestation; Diseases and pests; Importance and uses; Description of the wood, general properties, macroscopic and microscopic features.

The illustrations include botanical drawings, "habit photos," and excellent photomicrographs of the transverse and tangential sections of the wood.

The work begun by this publication is an ambitious one and worthy of encouragement. It examines the tree, not from the view point of the botanist alone, nor the ecologist, nor the silviculturist, nor the pathologist, nor the lumberman, nor the wood technologist but is of interest primarily to the forester. It enables him to really *know* his trees. It recognizes the parity of importance of the questions "How well does the tree grow?" and "What is under the bark?"

As a pioneering effort in this type of publication this work is remarkably well presented. However, it is hoped that in the future parts of this series some of the "rough edges" will be corrected. Scales should accompany all descriptive drawings. The proper illustration of wood anatomy should include high-power photomicrographs of transverse, tangential and radial sections and low-power photomicrographs of at least the transverse section, instead of only high-power of transverse and tangential sections for softwoods and low-power of transverse and high-power of tangential sections for hardwoods as shown in this publication. A table is given showing that the most definite distinction among the three softwoods described is the "number of pits per cross-field" on the radial section, but no radial sections are presented to illustrate this.

It would be well to emphasize the paragraphs on uses a little more. There is no more illuminating description of the properties of wood than a good list of its uses. For what do the natives of East Africa use these woods? The frequent references on botany, ecology, and importance and uses give the text the sound of remoteness from the field, and lead the reader to ask, "Have these species been studied in their natural habitats by the authors?"

HEREFORD GARLAND,
University of California.



SOCIETY AFFAIRS



SOCIETY AFFAIRS SESSION

Meeting called to order 9:30 A. M. by Chairman Guthrie.

Executive Secretary's annual report by Franklin W. Reed.¹

Moved by Colonel Graves that the report be accepted with an expression of appreciation for the work being done by Mr. Reed as Executive Secretary in demonstrating the value of that office, and the conviction of this meeting that the work should go on. Seconded and passed.

Report of the Editor by Emanuel Fritz,² Mr. Fritz tendering his resignation as editor. Mr. Carpenter spoke at length on the standards of magazine making as related to the field of advertising, relating some of his experiences in trying to obtain advertising for the JOURNAL in previous years. He praised Mr. Fritz for materially raising the standards in this direction as well as in a literary one and expressed himself as believing that, with energetic pushing, there was now no reason why the JOURNAL could not be made nearly or quite self-supporting from its advertising. After some discussion of the points raised by Fritz in his report respecting the editorial policy of the Society, it was moved by Colonel Graves and seconded by J. D. Coffman that Mr. Fritz's report be accepted and placed on the records. Carried.

Mr. J. R. Curry of the California Section then spoke on the desirability of establishing student sections of the Society. He recalled that this was proposed at the Philadelphia meeting and turned down. He expressed himself as still thinking that

this was highly desirable. He discussed the policies of other technical societies in respect to this matter, especially the American Society of Mechanical Engineers, which has student sections in 46 of the 48 states. These sections hold meetings and in all other ways function as regular sections. The dues of student members are \$3.00. They receive copies of the *A.S.M.E. News*, also one copy of the *Proceedings* for each fifteen members, for their section reading rooms, etc. They also have the use of the Society employment service. At the end of the senior year the honorary chairman of the section, who is the faculty advisor, meets with the student chairman, goes over the list of graduating members, and the men recommended are automatically elected by the Society. Such new members then pay an initiation fee of \$10.00 but no dues for the first year.

Our Society of American Foresters is growing in membership, but the rate is disappointing in respect to the proportion of new forestry graduates. We ought to get these new men. Such a scheme of student sections will give stabilization to the Society, will help the students, will help to keep them in forestry and will add to the future strength of the Society. It need not be an added expense to the Society. It will be worth much to it.

McCarthy spoke advocating continuing the Executive Secretary's position, also favoring the student sections as advocated by Curry.

Regional Forester Evan Kelley: What concerns me in respect to the Society is that, in my judgment, it lacks an assertive program, a program which puts down the things for which it stands and what we are going to do about it. Harking back

¹Page 227 of this issue.

²Page 233 of this issue.

to the Public Land Commission, if the Society during the thirty years or more of its existence had pressed a vigorous and assertive policy, we would have been one of the ring leaders to whom official Washington would have turned. But we were ignored and had to horn in with our views. Also, when the President's Timber Conservation Board was organized, the same thing happened. If the Society with its broad representation throughout the country had pressed a constructive policy in that direction, it would have been able to be a material factor in the administration's policies. We must come to positive grips with some of these things which are now pushing us around the ring.

The thing which Colonel Greeley presented in his paper is not new. What is our policy in that regard? What about taxes and delinquent land? What about state aid? What has the Society done to clarify that subject and what is its policy? If it has any I don't know it. What about forest land acquisition, federal or state? What has the Society done to enlighten those who are responsible for such action? What has the Society done to establish its position in respect to game management, to guide the program in that direction? What about recreation? The President has taken action subtracting recreation from forestry and making it a matter of health. Are not these things things which the Society should talk about and also formulate policies on and make itself felt? What have the foresters done to help out the lumber industry from its predicament, largely of its own making? I don't think we can do much, but to the extent that we can go without sacrificing our own objectives it should be done. But what has the Society done about it? Something should be formulated and carried out. Rutledge also made a suggestion yesterday worthy of attention. It deals with the very guts of the administration of the

wild land of the nation. What *are* we going to do about it?

Chairman Guthrie: Over a year ago the Society did set up a committee on policy and its report was sent to every member. Following that, several committees were set up. They have not yet reported but they are functioning and hope to get somewhere.

Mr. Curry: Moved that this meeting recommend to the Council to reconsider the question of establishing student sections of the Society. Seconded by Mr. Coffman. Passed.

Colonel Graves: The Society has sections which are very live but the Society as a whole has not taken sufficient leadership. To get a national society like ours to work out through committees takes a long time. The problems which Kelley brings up are on us right now. The Society should at least have a clear idea of its own scope and ideals. Five years ago I went away from the meeting here with the idea that many had the feeling that policy and action was being left too much to the "big shots." In the profession of forestry as a whole, we have some tremendously vigorous pent-up forces which are not expressing themselves. In the university one of the big problems of administration is to utilize the men's talents to give the students a chance to express themselves. We are not getting that expression in the Society. Talking about lack of leadership, we won't get an superman to lead us to the tune of "Marching Through Georgia." If we could get these forces to express themselves we would get leadership.

Coming out here I have stumbled upon all sorts of ideas that were new to me. Let us get these to expression. If the federal government must come in, we of the Society must give it support, see that it has the organization and the means to express our convictions. I should greatly dislike to see the water problem turn

over to engineers out of the hands of the foresters. I think the decision of the President to keep the Forest Service in the Department of Agriculture is one of the most important things of recent history. We have got to give the Forest Service the opportunity to do its job, and it must be so organized and administered as to give its men the chance to do their jobs. We have got to utilize the brains and thinking of the younger men more than we have done so far.

Mr. Kelley has spoken of several important points upon which we should be taking action. The overshadowing thing, it seems to me, is that our mature timber is being dissipated far in advance of demands and necessity. We have got to see how we can prevent this liquidation. It is not a question of helping the lumberman or pulling him out of the hole, but a tremendous public problem, and I think the foresters are the ones who must work it out. How far can the Society go? Fritz, would an article by me on that point be propaganda in your view? The blister rust matter goes a good deal farther than whether we can have a little more white pine, into the question of whether we are going to maintain community life. Every forester is in a strategic position in regard to some particular thing, but every little while we run into some of these inhibitions.

Mr. Coffman: The Society's membership manual to me is a red rag. Yesterday, Buck gave a paper in which he mentioned that recreation and landscaping were not being given proper attention. Kelley said that the wild life was not getting it. And for years together this Society refused to recognize a grazing assistant as a forester for the purposes of membership. The Forest Service has designated recreation as a major activity. Yet the Society goes on record that forest recreation is not enough of a forestry activity to justify Society membership. Suppose we go before Congress to get money for recreation.



Members of the Society of American Foresters assembled at the 32nd annual meeting, San Francisco, California.

How can we urge them to give it to a forestry organization if we do not recognize it as forestry? If we don't take a broader point of view, in ten years more the recreationists will have a society of their own. That will weaken this Society. It will develop a cleavage between the two which should not be there.

I offer the following resolution: That we go on record as disagreeing with the arbitrary limitation of membership activities, and request the Council to take it under advisement with a view to rectifying the situation. Motion seconded and carried.

Mr. Zon: I still come back to the policy of the JOURNAL because that is the door through which we go out to the people. I believe it must have a liberal policy. I believe it to be a rotten policy when the address of Gifford Pinchot at the dedication of the monument to Theodore Roosevelt is refused publication. I wrote Fritz, telling him I heard he had refused to publish it. He said, no, he would publish it but it has never appeared except as a footnote. When such a man as Gifford Pinchot has no access to the JOURNAL I think it is pretty rotten, as well as to designate some of us as propagandists and abuse what we publish as fantastic. Fritz is just ignorant of what is going on. Selective logging started in the Lake States five years ago and is just now getting out here to the Coast. You, out here, have a big problem in the troubles of your lumber industry, but it is not the only trouble and I don't think it is the most important. One of the most important is land utilization. This particular movement, begun by foresters, is being taken up in other fields. I heard one man say this was not the problem of foresters, that it belongs to the agricultural economists. The Society should have a program, but don't mistake it as the only agency some of us are going to patronize. First, in this program I place land utilization. Second, control, either regulation or ownership, of all protection forests. Millions of dollars have

been spent on the improvement of the Mississippi River to protect it from flood damage but not a cent to protect its forests and prevent the floods. Third, we must work out some kind of program so that the remaining mature forests shall not be dissipated or destroyed. A great deal of our unemployment will not be reabsorbed. It can not be because of technological impossibilities. Now we are faced with a lack of work. We will have great public works, that is certain. I would like to see included in those public works the improvement of our forests. In doing this public work I would like to follow what has been done so successfully in England and Canada in land settlement in small parcels and giving the men work in the public forests.

Mr. Fritz: Denied that he had refused to publish Pinchot's article and explained the circumstances.

Colonel Graves: Presented the report of the Committee on Public Regulation of Private Exploitation. Report accepted and referred to the Council.

Mr. Cecil: Read for Chairman Hosmer the report of the Committee on Public Forests and Protection Forest Zones. Report accepted and referred to the Council.

Mr. Reed: Read the report of the Committee on International Relations. Report accepted and referred to the Council.

A communication was read from President Granger in respect to the Schlick memorial fund. Communication accepted and referred to the Council.

The report of the Resolution Committee was read by Professor Mulford, Chairman who made the following supplementary statement: "We received one resolution from the floor and one brought from the East, both of which we turned down. These resolutions were both read and the Committee action was allowed to stand. Mulford spoke of the unsatisfactory results growing out of the fact that it was impossible on the spur of the moment for a currently appointed Resolutions Com-

mittee to draft anything comprehensive and well-considered in respect to major policies, or to obtain well-digested consideration of them when sprung upon an unprepared meeting, if the resolutions could be drafted. He proposed the possibility of appointing the Resolutions Committee for any given meeting at the meeting of the year before. Various members pointed out difficulties in such a procedure. No formal action was taken but the difficulties of the situation were recognized and the consensus of opinion agreed in hoping that the Council would give consideration to some means of bettering the situation. Moved by Mr. Cecil that the entire statement of the Resolutions Committee be accepted. Seconded and passed.

Mr. Coffman: Raised the question of action by the Society in respect to members losing or in jeopardy of their positions from political causes and through no fault of their own. Executive Secretary Reed explained that the Central States Section had brought up this question and asked its consideration by the Council; that the Council felt that the Society could appear as character witness but not as to efficiency unless it had made a competent inspection by its own machinery; that it was the function of local sections to take such action as appeared warranted but that the parent Society should not act except in extraordinary cases.

Mr. Morrell: Stated that the Council was cautious because there are so many complications that can arise in state work and influences involved which we can not always be aware of.



REPORT OF THE EXECUTIVE SECRETARY¹

I have here our auditor's report for the fiscal year ending November 30, 1932. It will be printed in the JOURNAL. Unless,

therefore, you insist, I will not read it in full but will limit myself to pointing out the important high lights of our financial status.

First let me emphasize that in this year 1932, the worst of all business years, the Society has carried through and closed its books with a cash surplus of over \$1,300. Its income for 1932 has been slightly larger and its expenditures somewhat less than for 1931. The reduction in expenditures has been brought about, not by curtailment of activities, nor by lowering the standards of service, either quantitatively or qualitatively, but by the process of introducing more efficient methods that have permitted the executive staff to do the same things more cheaply. This applies particularly to the cost of printing the JOURNAL, which was \$8,124.95 in 1931 and \$6,811.74 in 1932. This saving was effected by working out with the printer numerous minor economies in printing, make up, binding, etc., with the result that the Society has continued to produce its standard 128-page magazine with the same allowance for half-tone reproductions. Moreover, the type-size page adopted during the year makes 128 pages of printed matter equivalent to 146 of the old style. We are, in short, now getting more and better JOURNAL for less money than we ever did before.

STEADY FINANCIAL IMPROVEMENT OF PAST THREE YEARS

A comparison of the Society's finances for the past three years is instructive and justifies a courageous and optimistic attitude toward the future. In 1930, the first year in which we employed a full time, paid, Executive Secretary, the Society closed its books with a deficit of some \$1,100 which had to be made up by draft on the reserve fund (the accumulated surplus earnings of previous years). In 1931

¹Presented at the 32nd annual meeting of the Society of American Foresters at San Francisco, Calif., December 14-16, 1932.

the Society closed its books with a cash surplus of \$77.08 which it was able to add to its reserve fund. In 1932 the Society has closed its books with a current annual income exceeding current annual expenditures by \$1,315.87. After setting aside \$172.57 for depreciation on office equipment and \$135.75 for interest on the permanent fund (which amount need not be set aside at the discretion of the Council) there remains \$1,007.55 to add to the accumulated reserve and to meet expenses of the coming year. In brief we have been making steady, uninterrupted progress toward the point where it will be possible to finance the present executive establishment out of regular annual income and it will no longer be necessary to call upon interested members for special contributions to the so-called Executive Secretary Fund. That we have not yet attained that goal is no excuse for pessimism; on the contrary the fact that we have made such marked progress in the face of such marked adverse business conditions gives us every justification that we plan courageously and optimistically for the future.

It is timely, therefore, to consider in a constructive way the financial prospects for 1933. A *preliminary* budget, prepared for consideration by the Council at its meeting in Washington on November 26th, puts the estimated total expenditures at \$22,370.00 and the estimated income from all regular sources at \$19,450.00, a possible gap of \$2,920.00. This estimated income for 1933 includes \$1,107.48 in hand, the balance remaining from the Executive Secretary Fund of \$18,580.98 which was raised by subscription and pledge in 1929 for the purpose of carrying a paid Executive Secretary for a three-year period ending March 31, 1933. In addition to this \$1,107.48 which is on hand and immediately available, there remains \$933.99 of as yet unredeemed pledges to the fund, payable on or before

March 31, 1933. To the extent that they are redeemed, to that same extent will the prospective gap between outgo and income for 1933 be reduced.

Furthermore, subscriptions and pledges to the new Executive Secretary fund, in response to President Granger's circular letter to the members of October 22, 1932, already total over \$1,500.00 and the fund is still growing. The prospective gap therefore has already been reduced by this amount from \$2,920 to approximately \$1,420.00.

In addition since the Council meeting on November 26th I have found it possible to cut out an expense item of \$300.00 and since leaving Washington have discovered a possibility of increasing our miscellaneous income by probably \$400.00; that is the said "gap" of \$1,420.00 has already been reduced to a trifle over \$700.00 and the new fiscal year is hardly begun. As we go on through the year cumulative small economies in expenditures and the building up of income from all possible sources will, I am confident, wipe out the gap entirely, balance our budget, and may even permit us to wind up the year with a surplus. All we need is the faith in ourselves and in our Society that will give us the courage to carry on.

MEMBERSHIP

Most associations, professional, trade or public service, have suffered heavy losses in membership during the past year. Our Society is one of the very few that has gained. As of December 31, 1932, details are as follows:

	December 1931	December 1932
Junior _____	1,108	1,176
Senior _____	731	736
Associate _____	50	49
Fellow _____	12	12
Honorary _____	13	11
Corresponding _____	8	7
	1,922	1,991

As of November 30, 1932, gains and losses in membership are as follows:

	Corr.	Hon.	Fellow	Senior	Junior	Asso.
Cancelled	1	2	1	24	91	4
New			1	38	152	3
Gain				14	61	
Loss	1	2				1
Total gain membership:	73					

During the year the following members have died: Fellow, J. W. Toumey; Seniors, W. W. Ashe and Frank J. Klobucher; Juniors, Clarence E. Balizet, C. J. Hash and Howard R. Spelman; Corresponding, A. Opperman; Honorary, F. H. Newell and Adam Schwappach.

Members in arrears on their annual dues. For 1931-1932 (Asked for and granted extension): Juniors, 15; Seniors, 11; total, 26. Arrears for 1932 (Asked for and granted extension): Juniors, 28; Seniors, 13; Associate, 1; total, 42. Arrears for 1932: Juniors, 131; Seniors, 64; Associates, 7; total, 202.

Subscription details are as follows:

	December 1931	December 1932
General	696	609
Student	96	107
Complimentary	31	37
	823	753

ACCOMPLISHMENTS OF THE EXECUTIVE SECRETARY TO DATE, AND PLANS FOR THE COMING YEAR

So much for the financial and membership status of the Society. I now come to the Executive Secretary's report proper. You are all entitled to know what he has been doing in the past year to earn his keep and what the plans are for the coming year.

President Granger's letter of October 22, which went to all of you, gave a concise summary of all activities and accomplishments since the Society first em-

ployed my predecessor in office, W. R. Hine, beginning April 1, 1930. Furthermore, there has gone to you each month, in the Society Affairs section of the JOURNAL, under the heading, "Doings of the Executive Secretary" a report for the preceding thirty days of the activities of that officer in the service of the organization, of its individual members and of the cause for which it stands. Since all of you assiduously read each issue of the JOURNAL from cover to cover as it comes from the press, it would be a waste of your valuable time if I should attempt to reiterate to you here all the details of all those monthly reports. It would be more profitable, I am sure, to confine our attention to a few of the more outstanding activities and accomplishments of the year just past and to refer briefly to the major proposed activities for the year to come.

To begin with, one of our prominent and influential members, Evan Kelley, has raised the question: Has the Society a plan of work, if not why not, and if so, what is it—or words to that effect. Let me answer him that the Society has a *master plan* in its Articles of Incorporation, drawn up and adopted in October, 1928. I read from them as follows:

"The particular business and objects of the Society are to encourage a broad and constructive practice of forestry; to stimulate research and achievement in the science of forestry; and to advance the profession of forestry through coöperative thought and a spirit of solidarity among foresters."

In the Society's membership manual which was approved and promulgated last spring by the Council (and this manual, by the way, while it was in the making absorbed much of your Executive Secretary's constructive time and effort), there is the following definition of "Forestry Work."

"The interpretation of 'Forestry Work' shall be liberal. The membership should include qualified foresters from the full

field of forestry without preference to any given branch of work. By 'Qualified Foresters' is meant those with a basic training derived from a completed forestry course in an approved school of forestry, or the practical equivalent thereof. Briefly, forestry work covers the protection and management of forest land, forest research, forest education, the utilization and marketing of forest products, or specialization in any line contributing material data to these fields. Thus, for example, logging, forest engineering, timber valuation, wood technology, forest economics, forest entomology, forest pathology, and range management as related to forest management, are all regarded as forestry work. In the JOURNAL, H. S. Graves, says:

"There was a time when some of the activities and occupations (of foresters) were regarded as rather outside the sphere of forestry. Even now the question is often agitated whether a graduate forester who is employed by a lumber company in work connected with the manufacture and distribution of products is still one of the elect and worthy of continued recognition as a forester. It is my impression that some of these men may soon be in a position on account of their experience and contacts, to aid in developing industrial forestry on a large scale and setting forestry ahead more effectively than many other foresters who have been engaged in work more peculiarly connected with the growing of trees. I certainly hope that we shall not look askance at those trained foresters who at the moment are building roads, making maps, supervising accounting, or doing other work that might be performed by someone who does not possess the special knowledge of the science of forestry."

"This interpretation does not mean a lowering of the standards of membership. Those are maintained through the training and experience requirements for membership and the capacity qualifications for Senior Membership.

"The work of city foresters, arboriculturists, shade tree specialists, park superintendents, park or forest recreation specialists, or lumber salesmen, is rated as forestry work in the case of candidates

for Junior Membership who are graduates of approved schools of forestry, or who have qualified by six years' creditable experience as defined in the section of this manual headed 'Creditable Experience for Junior Member.'"

The above two quotations are, in effect, the Society's master plan. But the Society has gone further than that. Immediately following the adoption of the above mentioned Articles of Incorporation, at the annual meeting in December 1928 in New York City (the same meeting where the decision was reached to employ a paid Executive Secretary) the members present concluded that the time had arrived for the Society to draw up and adopt a definite statement of national forest policy to guide it in its future action. The President and the Council accordingly appointed a Forest Policy Committee whose subsequent two years' labor resulted in a statement of "Principles of Forest Policy for the United States," which in May, 1931 was submitted to a referendum of the Society membership and adopted by an overwhelming majority. The Forest Policy Committee then went out of business and in its place five supplemental committees were appointed, each one of them to work into a definite program of action one of the five most important principles of forest policy. These five committees have been at work for about six months and progress reports are expected from them later on today.

SPECIFIC ACCOMPLISHMENTS

The list of things done, as given in President Granger's letter of October 22, is in effect a detailed plan of work for the coming year. Practically all of those activities are continuing projects, which, under the direction of the President and Council, will engage the time and effort of your Executive Secretary during the coming year, and maybe beyond. New

projects also arise from time to time, and must be filled into the program.

It will be worth while, I think, to describe a few of the more interesting of these activities by way of illustrating how the Society's work is being carried on.

FEDERAL REORGANIZATION

Proposed plans for reorganization of the federal executive departments, insofar as they might affect the government's conservation activities, have as you know long engaged the interest of the Society. In the fall of 1930 a special committee drew up a plan which proposed that all organic conservation activities be grouped under the Department of Agriculture. This plan was submitted by the Council to President Hoover and later published in the JOURNAL, so that you are already familiar with its details. At its meeting in New Orleans last winter the Council reaffirmed its approval of this organic plan and authorized the Executive Secretary to take such steps in its furtherance as subsequent developments might indicate. In the meantime several organizations interested in the proper conservation of the nation's organic resources have voiced their approval to substantially the same organization principles. When, therefore, President Hoover last October announced that he had directed the Bureau of the Budget to prepare for submission to Congress in December a federal reorganization plan, your Executive Secretary was able to join with the representatives of the National Grange, Federated Farm Bureaus, Izaak Walton League, American Game Association, Association of State Foresters, and American Forestry Association, in a hearing with the Director of the Budget, at which we unanimously recommended the grouping of all organic conservation bureaus and activities under the Department of Agriculture. We can congratulate ourselves that President Hoover's

plan so nearly conforms to our own ideas. Whether Congress will allow Mr. Hoover's plan to go into effect or will attempt modifications to the detriment of the conservation interests remains to be seen. The situation needs watching.

PUBLIC DOMAIN LEGISLATION

The President's Committee on the Conservation and Disposal of the Public Domain, completed its labors, as you will remember, and submitted its report in the spring of 1931. President Hoover transmitted the report to Congress with a view to early legislative action in the winter of 1931-1932 to put its recommendations into effect.

I brought the matter to the attention of our President and Council, on the grounds that there was a national conservation problem in the correct solution of which the Society of American Foresters could and should play an influential part. The ensuing correspondence and discussion during the summer made it possible in the fall for the Council to agree unanimously on a set of principles which should govern in any legislation affecting public domain administration or disposal. (This set of principles was published at the time in the JOURNAL so that I need not take time to reiterate them here.) Consequently when Congress convened in December 1931 and the so-called administration bill was introduced it was possible for your Executive Secretary to appear before the Congressional committees in opposing it and to assist in killing it, thus clearing the way for the introduction of the so-called Colton Bill which is before Congress for action this winter and in support of which I may have to appear during the hearings on it.

CENTRAL STATES FORESTRY CONGRESS

Heretofore this has been primarily an annual meeting affair, attended by pro-

fessional foresters and public spirited conservationists in the region for the purpose of interchanging ideas and passing resolutions. On the eve of the third annual meeting, last November, some of the more active supporters of the Congress conceived the idea that there was need for a more effective form of organization which could continue active throughout the year in support of the forestry and conservation movement. Your Executive Secretary was urgently invited to attend and assist in the perfection of such an organization. I did so.

This instance is illustrative of the growing prestige of our Society and the appreciation accorded our counsel and coöperation. A very few years ago, in planning such an undertaking it would never have occurred to anybody that the Society of American Foresters had a place in the picture at all.

NATIONAL PARKS ASSOCIATION COMMITTEE ON THE SHENANDOAH NATIONAL PARK

In December, 1930 at the annual meeting in Washington the Council was asked to endorse the proposed Everglades National Park in Florida. Although a resolution of endorsement was passed by the open meeting of the Society, nevertheless, the Council felt that it could hardly take action since we have never developed any clear cut standards or definitions to guide us in reaching a decision whether a given area actually does lend itself to that form of ownership and administration.

Effort has been made to work out such definitions in coöperation with the National Parks Association, but that organization itself has found it an extremely difficult task because of the complicated and antagonistic views of the numerous alleged national park experts.

In the meantime the Shenandoah National Park in Virginia authorized by Congress in 1924 and whose lands are

being purchased by the State will soon be completed and turned over to the National Park Service. The National Parks Association is interested to know what objectives and what policy and plan of management could best justify the maintenance of the area as a national park. To that end it has appointed a committee to study the area and has asked your Executive Secretary to serve on it. This is a problem in forest conservation on the opposite extreme from that of commercial timber growing and is an earnest of the wide range of interests and contacts which our organization and its members have. The National Park Service already employs a number of our members and with the completion of the three new eastern parks now in the making it undoubtedly will need the services of additional trained foresters.

RECONSTRUCTION FINANCE CORPORATION REFORESTATION LOANS

The Emergency Relief and Construction Act of 1932 in authorizing loans for "self-liquidating" projects includes a clause authorizing loans on forest properties whose plans of management embrace provision for fire protection and for cutting of the timber in accord with such silvicultural requirements, under supervision of the state forester, as will insure the "Reforestation" of the land. The United States Forest Service has been advising with the Reconstruction Finance Corporation as to what those requirements should be. In the meantime two applications for reforestation loans have been filed and are now going through the mill. When I left Washington they had reached that stage where the Reconstruction Finance Corporation had asked the applicants to employ a properly qualified forester to examine their properties and to report whether their condition and plan of op-

eration was such as to offer adequate security for the proposed.

The result of our conference was that the two applicants decided to propose to the Reconstruction Finance Corporation that they would employ for the purpose any forester whom the Reconstruction Finance Corporation, on advice of the Society of American Foresters, might suggest to them.

This reforestation loan business is just in its infancy. The right way to do it probably must be worked out by the process of trial and error. It affords, however, two opportunities of moment to our Society — first to expand the practice of industrial forestry and second, to create new employment opportunities for properly qualified members of our profession. Toward those ends I propose to keep closely in touch with the situation and to continue the contacts that I have already made with the proper officials of the Reconstruction Finance Corporation.

WHITE PINE BLISTER RUST CONTROL

This is a forest problem of nation wide importance concerning which our Society as yet has never attempted to do anything beyond passing a more or less superficial resolution now and then at an annual meeting. Possibly the time has come when our Society as the professional body should get its feet under itself in this matter and coöperate with the other parties at interest in the attempt to work out a systematic, economically sound, and commonly acceptable national policy or program for control of the disease. May I express the hope that this meeting may see fit to take some constructive action?

PROFESSIONAL EMPLOYMENT RELIEF

Undoubtedly one of the first duties of the Society and of its executive officers is to develop new employment opportunities for those of our members who have been

displaced by the economic upset. This duty, let me assure you, your Executive Secretary keeps constantly in the front of his mind; in his contacts with the fishy eyed bankers of the Reconstruction Finance Corporation or with the more dreamy visioned supporters of the National Park cause.

FRANKLIN W. REED,
Executive Secretary.

NOTE: The discussion which followed the submission of the Executive Secretary's report led to a motion by H. S. Graves, seconded by W. S. Carpenter, to accept the report, endorse the work the Executive Secretary has been doing and to approve its continuation along present lines. The motion was carried.



REPORT OF THE EDITOR RESIGNATION TENDERED

Volume 30 of the JOURNAL OF FORESTRY, which is completed with the December number, marks a further improvement in the make-up and contents of the Society's official organ. It contains fewer pages than Volume 29 but practically an equal amount of text material. This was accomplished through a change in the type-page. The style of type, 10-point Bodoni Book, remains the same, but the lines are slightly longer and more closely spaced. The present type-page makes it possible to get into 128 pages the equivalent of about 146 pages of the old. The paper adopted in the October 1931 issue continues the same. This paper makes it possible to run half-tone cuts without the extra cost of "tipping in."

For the first time in the history of the JOURNAL the index was published in the December issue. This required considerable extra labor but is a desirable precedent to continue.

Mailing of the JOURNAL, while irregular

as to the exact date, has been reasonably prompt. The most distant subscriber within the country gets his magazine before the 15th of the month for which it is dated. Ordinarily mailing is much more prompt but occasionally unforeseen difficulties and hold-ups, as in the case of the December issue, have made consistently prompt mailing impossible.

Although the manuscripts being received continue to improve in quality, timeliness and in numbers, there is still a lack of balance in subject matter. A journal like ours must give space to *all* the branches of forestry and should offer something each month to each class of reader. More material on some subjects is received than can be used, and so little in others that solicitation had to be resorted to. The same is true of subjects of peculiar timeliness. Some members of the Society seem to think that the JOURNAL is deteriorating when it does not print harangues on the need for forestry or diatribes against lumbermen. The Editor has held to the belief that it is *settled* among the readers that forestry is desirable and necessary, and that nothing can be gained by continually arousing the animosities of private owners and that space had best be devoted to actually advancing the technique of forestry practice and the improvement for the possibility of forestry of any kind on private lands.

Editorials are written, as before, with a view toward provoking thought and discussion on topics of immediate importance and to put the JOURNAL in the class of leader in forestry thought.

One change occurred in the Editorial Staff during the year. Mr. C. G. Bates of St. Paul, after many years of editorial assistance of a high order, resigned because of pressure of his regular duties. His place has been taken by Prof. R. C. Hawley of the Yale Forest School. In the brief time he has been on the Staff Prof. Haw-

ley has rendered invaluable assistance, particularly in editing.

The Editor records with pleasure and gratitude the active interest of many individual members of the Society in the JOURNAL especially in seeking contributions on timely subjects, preparing requested reviews, and in devoting time in consultation with the Editor. Particularly is he indebted to Miss L. A. Warren in the Society's Washington office for consistent and high grade help in the mechanical and routine details of publications.

It is with the greatest regret and reluctance that the Editor has found it necessary to tender to the Council his resignation. After eight years as an associate editor and three as editor-in-chief this decision was not made without a personal struggle and with some sorrow. In this time he has come to regard the JOURNAL OF FORESTRY as one of the most valuable of the Society's activities for building up its strength, leadership and national confidence. However, the growing amount of time required for the proper conduct of the editorship has cut so seriously into his regular University work as to be regarded a handicap rather than an asset that he no longer can afford the sacrifice in time and income. In order to have time to begin at once to recover lost ground in his regular work he has asked that the resignation be accepted and become effective without delay. In the next issue of the JOURNAL the Editor will publish another report to the Council bearing upon its future. In this report the Editor recommends that steps be initiated to find ways and means to make the editorship a full-time paid position without delay, and that all the JOURNAL work be centered in the Society's official headquarters. He feels that in no other way can the JOURNAL continue to improve

and become the influential professional forestry magazine that it should be.

EMANUEL FRITZ,
Editor-in-Chief.



PRESIDENT GRANGER ACCEPTS FRITZ'S
RESIGNATION AS EDITOR

PROFESSOR EMANUEL FRITZ,
Editor, JOURNAL OF FORESTRY,
231 Giannini Hall, Berkeley, Calif.

DEAR FRITZ:

Your letter of December 17, is received.

Considering the entire situation, I do not see that you could have done anything else in justice to yourself than to give up the editorship. You have from time to time received so many favorable comments on your conduct of your task, that it is merely repetition to say on behalf of the Council and myself that the Society owes you a very large vote of thanks for your untiring efforts, the generous allotment of your time, and the high quality of your accomplishment in handling the JOURNAL. It is, of course, the general hope that your own personal interest has at no point suffered beyond cure because of this large contribution which you have made in the Society's interest.

I am sure to be on the coast sometime within the next six months and shall look forward to seeing you.

Very sincerely yours,
C. M. GRANGER,
President.



REPORT OF COMMITTEE ON THE PUBLIC
REGULATION OF PRIVATE EXPLOITATION

The Committee is not prepared at this time to present any final conclusions in the problem assigned to it. One of the members, Mr. Sparhawk, has been assem-

bling full information in regard to public control measures affecting private forests which have been adopted by the states, and also those of foreign countries. As shown by the exchange of letters between the members and the chairman, a great deal of constructive thought is being given to the question. In view of the rapid changes and many uncertainties in the economic and industrial situation, the committee is unanimously agreed that it would be premature for it to present any formal proposals under the present conditions. We therefore report progress, in the hope that by the next annual meeting the matter of public control affecting private forests may be made a matter of special consideration, with specific recommendations from the Committee.

HENRY S. GRAVES,
Chairman.



PRELIMINARY REPORT OF THE COMMITTEE
ON PUBLIC FORESTS AND PROTECTION
FOREST ZONES

Your Committee on Public Forests and Protection Forest Zones, set up in March 1932, submits as follows a preliminary report. The Committee is not as yet ready to make formal recommendations on the topics assigned it. But its members feel that the attention and thought of other members of the Society may well be directed at this time to the points touched upon in this statement.

THE FIELD OF THE COMMITTEE

This Committee came into being, with other special committees, to carry out the recommendation of the Society Committee on Forest Policy, that on the basis of the principles approved by the Society in 1931, small groups develop programs and suggest practical steps to put them into effect. In that set of principles are these

statements: "An extensive system of public forests is the core of a national policy of forestry," and "The policy now proposed includes two main phases: (a) the expansion of public forests to include all forests that should be in public ownership to protect navigable streams and other water resources; (b) a great expansion of federal, state, and county forests aimed primarily at assuring a part of the needed timber supply, at demonstrating proper forest handling, at rehabilitating devastated lands and lands abandoned for taxes, and at diverting submarginal farm lands into forest production." The work of this Committee rests on this mandate.

PLAN OF ATTACK

As a starting point the Committee unanimously assumes that there is need in the United States for more publicly owned forests. This implies an increase in ownership of forest land by the federal government, by the states, and by lesser political units. It implies, further, the application, in the making of additions to existing publicly owned forests, of each and all of several methods of acquisition now in use, to wit: transfer of public domain, purchase, exchange, gift, and the taking over by the appropriate authorities of tax delinquent, or other similar lands.

As your Committee sees this problem the first steps in finding a workable solution are the setting up of certain tangible and justifiable objectives toward which effort can be directed. In doing this a broad view should be taken of the needs and requirements of the Nation over many decades. That the country is just now in a deep valley of economic depression should not blind us to the fact that the life of the Nation is long and that we should plan for the future as well as for today.

Even with all the shifting in the demands made upon the forest as the result of recent inventions and of changed eco-

nomic requirements, it does not seem reasonable to discard the evidence of the past as to the value and necessity of devoting considerable portions of the non-agricultural lands of any country to the growing of forests.

The requirements of modern civilization demand services which can be performed only by the forest. Fully as important as being the only source in commercial quantity of wood and its derivative products, the forest serves man in other indispensable ways. It is axiomatic that from the standpoint of use its three main functions are supply, protection and recreation. In normal times and when this country reaches the stage where we must depend for our forest products exclusively on second-growth forests, the growing of forests should appeal to those interested in conservative, long time investments. Notwithstanding the situation in which the American lumber industry finds itself today, it may reasonably be expected that the time will come when the growing of timber crops will become a profitable business venture in certain parts of the country. But because the people as a whole, functioning through the federal government and the states, are in a better position to handle certain kinds of forest to better advantage than can any individual or company, there will always be need for public forests.

The experience of the countries of Europe has demonstrated beyond argument the fact that where the returns from a forest are indirect, public ownership is not only indicated but demanded. Protection forests and those where recreational use plays a large part fall within this class.

For these reasons your Committee feels that an extension of the existing systems of public forests,—national, state and community—is necessary to the continued and sustained economic welfare of the nation, and that such increases are particularly needed in the section east of the

Great Plains. It will of course take decades to complete any such program. But is it not one of the jobs of the forester to attempt to show his fellow citizens that it is the part of wisdom to take the long look ahead?

SOME PRINCIPLES THAT SHOULD GOVERN
THE ESTABLISHMENT OF MORE PUBLIC
FORESTS, ESPECIALLY IN THE EAST

In any large program for public forests the responsibility must be shared by the federal government and the individual states. Some states like New York, Pennsylvania, Michigan, Maryland, and others already have their own policies and are going ahead individually with state forest programs. Such action should be encouraged. Many of the states welcome federal coöperation. Some emphatically do not. There should be no attempt to force the establishment of national forests where the local people do not want them. It would obviously be desirable if more states than now have them were to set up state forests, and for some of those that already do have such reservations to increase their present holdings. The land-use investigations and the economic forest survey of the Forest Service are making available information which should be useful to numerous states in this connection.

The question of the relative responsibility of the federal government and the states at once introduces the matter of cost. Prof. H. H. Chapman's suggestion of using the total assessed value of taxable property within the state, divided by the net area of forest land, as a criterion of the ability of a state to invest in state forests, seems a reasonable one. In states where the tax base is low, there is obviously more need for the federal government to lend a hand in establishing national forests. The states with a large tax base are those which can, and probably should themselves take on this duty. There seems to be a growing feeling that the

federal government may well, other things being equal, give priority to the establishment of national forests in states that are less able financially to buy forest land than are some others in the Union.

Distinctly a state problem is the turning to account as state forests some at least of agriculturally sub-marginal lands which are coming back to the people through non-payment of taxes. In this problem each state has its own individual perplexities.

In all acquisition of land for public forests national, or state, the principle of securing areas sufficiently large and so located as to form workable administrative units is highly important. Particularly so when one of the functions to be served by the resulting forest is that of demonstration. Forests of this type should aid materially in bringing about a more general adoption of the practice of growing timber by private owners on their adjacent properties.

When it comes to the selection of land for national or state forests, and especially as between different areas, certain other principles need to be enunciated and observed. One that your Committee deems of special importance is that neither the federal government nor the states should be limited in the acquisition of forests to those on the poorer sites and soils alone, or even chiefly to the depleted, cut-over areas, often scarred by fire. Such lands present the most difficult situations for the successful practice of forestry.

Some of the land use studies make it appear that there are very considerable areas in the United States which must long be left merely as idle land. Presumably such areas must be protected from fire, lest they prove a menace to better lands. Some of these lands will doubtless have to be included under public forest ownership, but when proved sub-marginal for any sort of forestry other lands in

this class may well be left for some time to come to care for themselves.

The problem of the best disposition of the forest lands on the Indian Reservations is one that perhaps is in a class by itself. The proposals of the Office of Indian Affairs as to these lands, some six million out of a total of eight million acres, appear to this Committee to be sound. Namely that Congress should enact legislation which will maintain them permanently in consolidated ownership for forest production and water conservation purposes as "Indian Forests." One such project, The Red Lake Indian Forest in Northern Minnesota, created in 1916, has already given definite legal status to that tract of 110,000 acres as community property of the tribe affected. Your Committee recommends that similar action be taken by Congress for the creation of other "Indian Forests."

Your Committee at this time sees no reason to recede from the position generally held by foresters concerning the value of protection forests as material aids in the regulation of runoff and the prevention of erosion. It reemphasizes the doctrine that the only logical way to give wise management to streams is to treat them as units from source to mouth, with due regard to the various types of regulatory measures that are required in different portions of their length.

The Committee recognizes, however, that there is a real need for more accurate, scientific data, covering extended periods, on the whole problem of the relation of various kinds of vegetative cover to stream flow and erosion control. It endorses the general idea behind the proposals made in 1930 by the Branch of Research of the U. S. Forest Service, which later found expression in the so-called Leavitt Amendment, which proposed the addition of a new section to the McNary-McSweeney Forest Research Act.

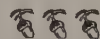
When a fitting opportunity comes, your

Committee feels that a similar measure should again be introduced in Congress and carried through. Action of this sort is the more needed today because of the reopening this past summer by certain members of the U. S. Geological Survey of the old controversy over the value of forest cover on watersheds. The only way to settle that question positively and finally is through the results of properly conducted scientific research. Were such information at hand as must result from such a study, the making of recommendations as to what lands should be set apart as protection forests could be done much more wisely than is now possible.

For the reasons set forth in this initial statement, your Committee feels that a decided increase in public forests is desirable, and that in the East it should include a much greater area than has been customarily thought of as necessary. Such an increase should include forests owned and managed by the Federal government, the individual states, and by smaller political units. It is frankly granted that any such program will be long in being brought to final fruition. It will have to be carried forward in many parts and sub-sections. But if properly conceived and presented, it should gain the support of the people.

Based on available official statistics prepared by the federal and state governments and on other reliable sources of information, your Committee has reason to think that for the section of the United States east of the Great Plains the ultimate total of land to be held as public forest should not be less than 50,000,000 acres.

R. S. HOSMER,
Chairman.



REPORT OF RESOLUTIONS COMMITTEE

The members of the Society of American Foresters present at the annual meet-

ing in San Francisco on December 16, 1932, make the following recommendations:

1. The present is a time of challenge and of opportunity. If the profession is to respond adequately, responsibility rests ultimately upon each individual member. Each of us has not only his own task to perform in the most competent way possible, but also to make sustained effort to contribute directly to forward movements whenever possible.

2. In order to get more general participation in the forward movement, and to make more rapid progress with it, it is suggested that it may be possible for small groups interested in certain problems to get in touch with one another and act as unofficial committees. This can be done by correspondence when it is not possible for members to meet in person. The younger members are particularly invited to avail themselves of this method of getting into action in the Society.

3. A definite responsibility rests on each of the sections of the Society to analyze the most pressing problems in each region, and to organize for definite and aggressive leadership in meeting the situation in their respective communities. Here, too, the younger members are urged to participate more vigorously.

4. We recognize the serious situation in which the timber industry finds itself in the present crisis, and we pledge ourselves to help in finding the way to a profitable and permanent basis of operation. In this opportunity for coöperation, both the industry and the profession have a real responsibility which must be met.

5. We recognize the need for rigid economy both in government and in private enterprise. The profession should prove its worth by showing how effective it can be under reduced budgets. Amount of service of real worth, not size of budget developed, is the direct measure of success in our work.

6. To the students in the forest schools

of the United States and to the graduates of recent years who have not found places in which they can begin service in the profession, we would say that we have profound faith in the future of American forestry. We believe it to be an essential need of national life, and that more than ever before men of ability and determination will find in it a satisfying life work.

7. It is recommended that a brief summary of the most essential points developed at this annual meeting be prepared and printed as promptly as possible in the JOURNAL OF FORESTRY, in order that members not present may have a clear picture of the general reaction at this important juncture in our development.

8. We urge the Council of the Society to request of the Director of the Budget, that the Society be given full opportunity to give to him its best judgment as to the most advantageous policies to be followed in the allocation of federal funds in the field of forestry. This is particularly important in times of retrenchment, in order that the least possible injury may be done both to the professional and the scientific sides of our work.

9. We recommend to the Council of the Society that it establish promptly a temporary committee to study the situation in blister rust control, the objective being the determination of policies to be followed, including the distribution of cost between the federal and state governments and the forest owners. The proposed study is of policy only, not of the scientific methods to be followed.

10. Similarly, we recommend to the Council that it establish a temporary committee on insect control, to report on the equitable distribution of cost between federal and state governments and the forest owners; and also, to recommend ways in which we can proceed more rapidly in finding less expensive and more effective control technique.

11. We appreciate very deeply President-elect Roosevelt's thoughtfulness in sending us his greetings and assurance of interest. We are happy in the knowledge that Governor Roosevelt realizes the part forestry must play in the life of the Nation, and that this has come in part through his intimate contact with the problems in New York.

12. We congratulate the Forest Education Committee of the Society for the fine results that have been attained. The gratitude of the profession is due particularly to Colonel Graves and Professor Guise, who have carried the burden of the details of the inquiry. Their joint publication, *Forest Education*, should result in important progress in professional standards.

13. To Professor Fritz we wish to express our gratitude for his outstanding work as Editor of the JOURNAL OF FORESTRY. Through his several years of able service, the JOURNAL has made an invaluable contribution to the progress of our work. We realize that this has been at great personal sacrifice to Professor Fritz.

14. We request the Council of the Society to do all it can to find a way whereby payment can be made for editorial service on the JOURNAL. The burden of editorship becomes increasingly heavy as the profession grows and the field enlarges.

15. In an effort to get better results from resolutions committees, we recommend that the experiment be tried of appointing a resolutions committee long in advance, perhaps even going so far as to appoint now the committee for next year.

16. We are grateful to the California Section, our hosts at this annual meeting, and are keenly aware of the large amount of work involved for the committees in charge. Our thanks to each and every one who has had a part.

The following are not included in our

formal report, but are for the information of the meeting:

We request the Executive Secretary of the Society to express to the Pacific Gas & Electric Company, and to Mr. Eddy, manager of the building, our gratitude for the use of their auditorium, so admirably adapted for our meetings. They have made a real contribution to the success of our gathering.

We also request the Executive Secretary to express our sincere sympathy to President Granger. Our thoughts are much with him.

LYNN F. CRONEMILLER,
R. H. RUTLEDGE,
L. E. STALEY,
JOHN B. WOODS,
WALTER MULFORD, *Chairman*.



PRESIDENT-ELECT ROOSEVELT TELEGRAPHS GREETINGS

I wish I could be with my fellow members of the Society of American Foresters at the annual meeting and send you all my best regards.

FRANKLIN D. ROOSEVELT.

John D. Guthrie, Acting President, replied as follows:

"We, your fellow members of the Society of American Foresters, assembled in national meeting in San Francisco express our appreciation of your greetings and pledge ourselves to work with you for the welfare of the Nation through forestry."



TELEGRAPHIC GREETINGS TO SOCIETY

The following telegrams were received and read at the annual meeting of the Society recently held in San Francisco:

"My best wishes go to you and the Society of American Foresters on this

important occasion. The past few years have brought us the challenge of new problems and new opportunities in the field of forestry. Let us always go forward profiting by the mistakes of the past and by the opportunities of the future. The Society must not fail as unhappily the Timber Conservation Board failed in providing a broad basis for a conservation policy. My heartiest wishes for a successful, profitable and memorable meeting.

CHARLES LATHROP PACK

"I congratulate all foresters that effort to destroy Forest Service by transfer to Interior Department, continued throughout three administrations, has finally been abandoned. Our victory is great. Let us celebrate it by renewed attack on forest devastation.

GIFFORD PINCHOT.

"On behalf of the International Union of Forest Research Organizations I wish to convey to the Society of American Foresters the greetings of the International body.

"The foresters of other countries are this year taking a keen interest in forestry developments in America and in the efforts of the Society to further a high type of professional forestry. Because of the critical condition of forestry and of foresters in other countries, the meeting this year is taking on added significance. It is the hope of the International Union that your meeting this year will prove to be one of the outstanding meetings of the Society.

E. N. MUNNS,

*Vice-President, International Union of
Forest Research Organizations.*

"Canadian Forest Engineers wish you all success in your meeting. Regret we cannot be with you in person. Appreciate the lead you are giving in forestry and expect this meeting will set new mile posts.

P. Z. CAVERHILL,

*President, Canadian Society of
Forest Engineers.*

"Best wishes from the Cornell Staff for most successful meeting.

R. S. HOSMER,
Cornell University."



SCHLICH MEMORIAL AWARD

In order to perpetuate the memory of the late Sir William Schlich, K. C. I. E., F. R. S., at one time Inspector-General of Forests to the Government of India and afterwards professor of Forestry at Coopers Hill College and later at the University of Oxford, a sum amounting to about £ 1,700 has been subscribed by his friends and admirers with the object of providing some memorial to him to commemorate his great services to the cause of forestry. Subscriptions were received from various parts of the British Empire and from the United States of America. The question of the disposal of the funds was considered by a committee, which decided that the interest on the sums collected should be paid each year in rotation to different parts of the British Empire and to the United States and devoted to some purpose calculated to further the cause of forestry. The fund has been placed in trust with this object in view, the trustees being the Chairman and Vice-Chairman of the Empire Forestry Association and the Professor of Forestry, University of Oxford.

The award during the past three years, beginning in 1929, has been made to Australia, New Zealand and India respectively. For 1932 the Trustees have selected the United States to be the recipient, and the Society of American Foresters has been chosen to carry out the plan.

The award amounts to £ 75. Under the plan of rotation adopted by the Trustees of the fund, it will come to the United States only at intervals of several years. It seems best to the Council of the So-

ciety, therefore, to put the sum out at interest and allow the awards to gradually accumulate until perhaps the interest thereon will be enough for a substantial scholarship to be awarded annually by the Society.

Meanwhile the Council believes the spirit of the Schlich Memorial offering will be best served by using the interest on the award to obtain a simple medal or certificate to be awarded periodically by the Council, in behalf of the Society, in recognition of some especially noteworthy achievement for the advancement of forestry in any one of its major branches. The award may be to an individual or an organization, in the discretion of the Council. An organization may be a state or federal conservation agency, a foundation, a forest school, a private or semi-public association, etc.

Nominations for the award may be made by the Sections of the Society, by individuals, or by other agencies. A nomination must be supported by a description of the achievement believed by the proponent sufficient to justify the award. All nominations must be in the hands of the Executive Secretary of the Society not later than November 1 of the year for which the award is sought. The Council will make the award each year unless in its judgment no sufficient achievement is recorded for that year. The announcement of the award will be made at the annual meeting of the Society.

By direction of the Council—

C. M. GRANGER,
President.



COMMENTS ON THE AUDIT FOR THE FISCAL YEAR

CASH IN BANK

Cash in bank shown on the balance sheet for the Society, for the Forest Education Survey and F. W. Reed, contingent

account, agree with amount shown in bank statements sent me direct by the Washington Loan & Trust Company, covering bank balance for these accounts November 30, 1932, after reconciliation.

PETTY CASH

POST OFFICE DEPOSIT

The impressed Petty Cash Fund in the office has been verified and \$22.34 was found to be on hand November 30, 1932. A deposit of \$10.75 is with the local Post Office to cover possible deficiencies in JOURNAL postage.

INVESTED FUNDS

On November 30, 1932, your Treasurer presented for my inspection, in the vaults of the Washington Loan & Trust Company, the securities owned by the Society.

Interest on International Match Company Sinking Fund 5% Bond has been in default during this year and this company is in the hands of a receiver. On October 9, 1932, this bond was deposited with Oscar W. Ehrhorn, Receiver in Bankruptcy, New York, as proof of claim and a receipt therefor is with the securities in the Society's safe deposit box.

In accordance with a Plan and Agreement of Readjustment proposed for the St. Louis-San Francisco Railway Company, dated July 6, 1932, the Society as holder of two St. Louis-San Francisco 4½ Consolidated Mortgage Bonds, has consented to a plan whereby interest due on coupons after 1932, will be deferred until 1937. Interest on these bonds for the current year has, however, been collected.

All proper coupons were found attached to the securities and coupons due during the year have been cashed and accounted for.

The Pennsylvania Railroad Company and the Pennroad Corporation having omitted dividends, no return has been re-

ceived by the Society on the stock owned in these companies during the current year.

Upon consultation with Mr. Sparhawk, your Treasurer, he advised that the bond of the International Match Company and the two bonds of the St. Louis-San Francisco Railway be continued to be carried in the records at cost to the Society, until a definite loss is realized on them. The total shown for invested funds on the balance sheet and in the schedule of securities, therefore, shows these bonds at cost, subject to the qualification by me that their value is questionable and problematical.

The present financial situation is such that the value of all securities has been seriously depressed and present day value of certain of the securities owned by the Society is materially less than their cost.

It has been developed that the Commonwealth of Australia Bond and the five \$100 U. S. 4 $\frac{1}{4}$ Gold Bonds were carried at a price in excess of cost and adjustment has been made to correctly state them at cost.

JOURNALS IN STOCK

REPRINTS

JOURNALS on hand November 30, 1931, totalled 17,133 copies and were carried at a value of \$4,675.75. During the year there were received from the printer 2,314 copies and 6 copies were purchased at a cost of \$3.00, making a total of 19,453 JOURNALS to be accounted for.

Intensive sales of JOURNALS during the year resulted in the receipt of \$791.02. JOURNALS were sold and distributed to the extent of 2,546 copies, leaving 16,907 JOURNALS on hand at the close of the year. In accordance with the policy adopted, the value of the JOURNALS was credited with the sales made, which results in a value at the close of the year of \$3,887.73 for the 16,907 JOURNALS on hand. This value is considered to be "Not readily realizable."

OFFICE EQUIPMENT

A new addressograph machine was purchased at a cost of \$300.00 to replace a second-hand machine acquired several

SCHEDULE OF SECURITIES

INVESTED FUNDS

Par Value

Cost

1 U. S. 1st Liberty Loan Gold Bond 4 $\frac{1}{4}$ s Reg. June & Dec. 15.....	\$ 500	\$ 500.00
5 U. S. Treasury Gold Bonds, 4 $\frac{1}{4}$ s, 1952, April & Oct. 15.....	500	489.69
1 Southern Pacific 4 $\frac{1}{2}$ s Gold, 1968, March & Sept. 1.....	1,000	1,003.75
1 Commonwealth of Australia 5%, 1957, March & Sept. 1.....	1,000	982.50
1 International Match S. F. 5%, 1947, May & Nov. 1.....	1,000	1,007.50
1 Missouri Pacific 1st Ref. 5% Gold, 1977, March & Sept. 1.....	1,000	1,013.75
1 Erie R. R. Ref. Imp. 5% 1967 May & Nov. 1.....	1,000	982.50
2 Federal Land Bank 4 $\frac{1}{4}$ s, 1953, Jan. & July 1st.....	2,000	2,055.00
1 Wheeling Steel Corporation 4 $\frac{1}{2}$ s Gold, 1953, April & Oct. 1.....	1,000	895.00
1 Penna. Co. 4 $\frac{3}{4}$, 1963, May & Nov. 1.....	1,000	999.24
3 Mo. Pacific 4% Gold, 1975, March & Sept. 1.....	3,000	2,415.00
2 St. Louis & San Francisco 4 $\frac{1}{2}$ s, 1978 Consol. Mtge. March & Sept. 1.....	2,000	1,867.50
1 American & Foreign Power 5%, 2030, March & Sept.....	1,000	880.00
2 Province of Ontario 4 $\frac{1}{2}$ s, 1943, Jan. & July 15.....	2,000	2,000.00
11 Shares Penn. R. R. Common Stock.....	550	820.26
7 Shares Pennroad Corporation.....	no	108.00

Total Invested Funds.....

\$18,019.69

Schedule A1.

years ago at a cost of \$50.00. Adjustments were therefore made to this account and the depreciation reserve.

Depreciation has been reserved on the investment in equipment at the conservative rate of 9 per cent equalling \$172.57.

PERMANENT SECRETARY FUND

The total pledged for this fund at November 30, 1931, was \$18,665.98. As the result of the decease of certain members, the amount pledged has been re-

COMPARATIVE BALANCE SHEETS NOVEMBER 30, 1931 AND NOVEMBER 30, 1932

ASSETS:	Year ended		Increase+ Decrease—
	November 30 1931	November 30 1932	
Cash in Bank	\$ 476.25	\$ 424.97	\$ 51.28—
F. W. Reed Contingent Account	246.61	250.00	3.39+
Petty Cash	22.34	22.34	—
F. W. Reed	3.39	—	3.39—
Post Office Deposit	10.75	10.75	—
Invested Funds, Exhibit A-1 ¹	18,032.00	18,019.69	12.31—
Accounts Receivable	181.31	270.13	88.82+
Interest Receivable	206.34	192.50	13.84—
Journals in Stock ²	4,675.75	3,887.73	788.02—
Office Furniture and Fixtures	1,667.40	1,917.40	250.00+
Office Supplies on hand	115.00	75.00	40.00—
Cumulative Indexes on hand	211.20	151.80	59.40—
Society Pins on hand	148.50	205.65	57.15+
Forest Type Reports	—	26.85	26.85+
<i>Forest Education Survey</i>			
Cash in Bank	641.88	409.11	232.77—
Petty Cash	24.61	—	24.61—
Invested Funds	1,930.00	—	1,930.00—
Advance on Printing Report	—	2,000.00	2,000.00+
Interest Receivable	37.50	—	37.50—
Dr. C. H. Guise	244.15	7.26	236.89—
Office Furniture and Fixtures	490.30	249.07	241.23—
Total Assets	\$29,365.28	\$28,120.25	\$ 1,245.03—
LIABILITIES AND NET WORTH:			
Membership Dues, Next Year	\$ 53.50	\$ —	\$ 53.50—
Membership Dues, Advance	58.00	108.00	50.00+
Subscriptions, Advance	156.19	140.52	15.67—
Permanent Secretary Fund	3,974.29	1,107.48	2,866.81—
Permanent Secretary Fund, 1933	—	1,043.83	1,043.83+
Reserve Forest Education Survey	3,368.44	2,665.44	703.00—
Reserve for Depreciation	486.58	643.40	156.82+
Reserve for Permanent Fund	2,990.00	2,990.00	—
Reserve for Permanent Fund Interest	877.17	1,012.92	135.75+
Surplus, per Exhibit B	17,401.11	18,406.66	1,007.55+
Total Liabilities and Net Worth	\$29,365.28	\$28,120.25	\$ 1,245.03—

¹Invested funds are stated at cost and include two St. Louis San Francisco Railway Bonds and one International Match Co. Bond, the values of which are questionable.

²The value ascribed to "JOURNALS in stock" is not readily realizable.

Washington, D. C.
December 5, 1932.

I have made an examination of the accounts and records of THE SOCIETY OF AMERICAN FORESTERS for the twelve month period ended November 30, 1932. The foregoing balance sheet, the accompanying income statement with comments thereon and qualifications regarding values of investments and JOURNALS in stock, in my opinion, correctly set forth the financial condition and result of operation for the fiscal year ended November 30, 1932.

FRANK A. LINZEL,
Certified Public Accountant (N. Y.).

duced to \$18,580.98. There has been applied from the collections on this fund, \$4,193.11 for eight months of 1930 and \$6,221.99 for the year 1931, or a total of \$10,415.10. The balance on hand at the beginning of this year was \$3,974.29 and \$3,257.60 has been collected during the year, making the total on hand \$7,231.89. Pledges remaining unpaid total \$933.99, some of which will probably not be collected. The amount on hand plus the amount outstanding totals \$8,165.88. On the basis of spreading the pledges over a period of three years, the above total is spread over the remaining sixteen months of the pledge from November 30, 1931. Therefore, three-fourths of \$8,165.88 or \$6,124.41 has been applied against the expense of the Secretary's office during the current year and \$2,278.45 was applied to the expense of that office from current earnings.

The balance on hand in this fund is, therefore, \$1,107.48 which, with pledges unpaid of \$933.99, will total \$2,041.47, applicable to the next fiscal year.

PERMANENT SECRETARY FUND 1933

In October 1932, an appeal was sent to the members of the Society, requesting contributions toward the support of the Secretary's office in 1933. There has been received in response to this appeal \$1,043.83 and pledges in the amount of \$454.00 to be paid in 1933.

INTEREST RECEIVABLE

Interest earned but not collected at November 30, 1933 amounts to \$192.50.

CUMULATIVE INDEX—SOCIETY PINS, OFFICE SUPPLIES, FOREST TYPE REPORTS

These accounts in the balance sheet reflect the cost of items on hand at the end of the year. Profit or loss on these

accounts is reflected in the income statement.

FOREST EDUCATION SURVEY

On November 30, 1931, the total balance on hand was \$3,368.44 which included \$490.30 expended for office equipment. Expenditures during the year, including loss on sale of bonds, equipment disposed of and general expense, was \$742.92; interest earned was \$39.92, making a net reduction of \$703.00 in the fund, leaving a balance of \$2,665.44, represented as follows:

Cash	\$ 409.11
Dr. C. H. Guise.....	7.26
Office equipment	249.07
Advance on printing report.....	2,000.00
Total.....	\$2,665.44

RESERVE FOR PERMANENT FUND, RESERVE FOR PERMANENT FUND INTEREST

The amounts standing to the credit of these accounts are specifically set apart from surplus.

The Reserve for Permanent Fund Interest has been increased \$135.75 by a charge against income. This amount equals 4.54 per cent of \$2,990.00, the average interest earned on investments of the Society being 4.54 per cent.

ADJUSTING JOURNAL ENTRIES

The journal entries necessary to adjust the accounts and close the records will be made under my personal supervision, so that the records accord with the financial statements submitted.

SURPLUS

A net increase in surplus results from the year's operations in the amount of \$1,007.55.

COMPARATIVE STATEMENT OF INCOME AND PROFIT AND LOSS
FISCAL YEARS ENDED NOVEMBER 30, 1931 AND NOVEMBER 30, 1932

	Year ended		
	November 30 1931	November 30 1932	Increase+ Decrease—
<i>Income:</i>			
Membership Dues Prior Years.....	\$ 375.50	\$ 591.81	\$ 216.31+
Membership Dues Current Year.....	12,766.18	12,214.95	551.23—
Journal Subscriptions Prior Years.....	161.62	22.50	139.12—
Journal Subscriptions Current Year.....	2,810.11	2,489.34	320.77—
Advertising	816.13	1,346.72	530.59+
Interest and Dividends Earned	1,073.04	818.82	254.22—
Society Pins	65.95	19.65	46.30—
Cumulative Index	98.26	15.46	113.72—
Profit on Sale of Bonds	45.00	10.00	35.00—
Forest Type Reports		108.77	108.77+
Gross Income	\$18,211.79	\$17,607.10	\$ 604.69—
<i>Deductions from Income:</i>			
Journal Expense	\$ 8,124.95	\$ 6,811.74	\$ 1,313.21—
Postage	637.74	341.64	296.10—
Miscellaneous Printing	312.15	88.18	223.97—
Editor's Expense	176.49	260.83	84.34+
Contribution, Union of American Biological Societies		50.00	50.00+
Salaries and Wages	4,635.60	4,124.42	511.18—
Rent and Telephone	948.01	836.35	111.66—
General Expense	651.42	365.76	285.66—
Addressograph Expense	54.86	36.42	18.44—
Telegrams	87.86	34.63	53.23—
Commission and Exchange	13.45	58.05	44.60+
Travelling Advertising	25.78	245.94	220.16+
Office Supplies	227.15	155.28	71.87—
Depreciation on Office Equipment	150.07	172.57	22.50+
Multigraph and Mimeograph	165.08	106.52	58.56—
Annual Meeting Expense	222.80	226.43	3.63+
Council Members Expense	4.85	46.01	41.16+
Report Committee on Industrial Forestry	93.75		93.75—
Report Committee on Forest Policy	234.79	200.33	34.46—
Loss on old Addressograph		24.25	24.25+
Deductions from Income	\$16,766.80	\$14,185.35	\$ 2,581.45—
Balance, Income over Deductions	1,444.99	3,421.75	1,976.76+
Totals	\$18,211.79	\$17,607.10	\$ 604.69—
<i>Income:</i>			
Less Interest Permanent Fund	\$ 1,444.99	\$ 3,421.75	\$ 1,976.76+
Balance	152.49	135.75	16.74+
Balance	A \$ 1,292.50	\$ 3,286.00	\$ 1,993.50+
<i>Executive Secretary Expenses:</i>			
Salary, Stenographer, one third of Rent and other allocable expense	\$ 6,712.09	\$ 7,569.62	\$ 857.53+
Travel	725.32	833.24	107.92+
Totals	\$ 7,437.41	\$ 8,402.86	\$ 965.45+
<i>Applied thereto from:</i>			
Permanent Secretary's Fund	\$ 6,221.99	\$ 6,124.41	\$ 97.58—
Current Year's Earnings	B 1,215.42	2,278.45	1,063.03+
<i>Earnings Remaining, Transferred to Surplus C</i>			
Prior Year Surplus	\$ 77.08	\$ 1,007.55	\$ 930.47+
Surplus	17,324.03	17,401.11	77.08+
A minus B equals C	\$17,401.11	\$18,408.66	\$ 1,007.55+

ACCOUNTS AND RECORDS

The audit of the Society's records discloses the alertness of those in charge of its financial affairs and records.

FRANK A. LINZEL,
Certified Public Accountant.



SPRING SUCCEEDS BAKER

Samuel N. Spring has been appointed Dean of the New York State College of Forestry at Syracuse, Clyde Leavitt becomes Acting Assistant Dean.

Professor Spring has been Assistant Dean of the college since February 1932 and chairman of the committee on graduate curriculum which reorganized the courses at the College of Forestry. He has made an exhaustive study of the curriculum looking toward the better coördination and effectiveness of training. He received the degrees of B.A. and M.F. at Yale in 1898 and 1903 respectively.

Mr. Leavitt, a Spanish-American War veteran, graduated from Michigan with the degree B.A. in 1901.

Mr. Leavitt was appointed Acting Director of Forest Research of the New York State College of Forestry in September, 1932, and has organized the Archer and Anna Huntington Wild Life Forest Station, comprising 13,000 acres in the central Adirondacks, recently given the College of Forestry by Mr. and Mrs. A. M. Huntington.



"FOREST EDUCATION" INCLUDED IN EXHIBIT

The Committee appointed by The American Institute of Graphic Arts has selected

the volume entitled *Forest Education*, by Dean H. S. Graves and Professor C. H. Guise, for inclusion in the 1933 exhibition of the Fifty Books of the Year chosen by the Committee annually from the volumes issued by all publishers in the United States for typographical excellence and distinction of design. This book is printed by the Yale University Press. The cost is \$2.50 a copy, and may be ordered through the Society's office.



HELEN E. STOCKBRIDGE
1871-1932

Helen E. Stockbridge, for 31 years Librarian of the United States Forest Service, and consequently widely known throughout the profession, died suddenly on December 20, 1932. In the early days of the Society, Miss Stockbridge, for a number of years, performed the duties of Secretary-Treasurer, and helped to edit and publish the JOURNAL. The profession owes her much.

MANUSCRIPTS FOR PUBLICATION IN
THE JOURNAL

With the resignation of Professor Emanuel Fritz as Editor of the JOURNAL OF FORESTRY and until another editor is appointed, manuscripts intended for publication in the JOURNAL should be sent to the Society of American Foresters, 810 Hill Building, Washington, D. C.

FRANKLIN W. REED,
Executive Secretary.

ELECTIONS TO MEMBERSHIP

The following men have been elected to the grade of membership indicated.

CALIFORNIA SECTION <i>Junior Membership</i> Orr, Thomas J., Jr.	NEW YORK SECTION <i>Junior Membership</i> Adams, Alton	SOUTHEASTERN SECTION <i>Junior Membership</i> Wallace, William G.
INTERMOUNTAIN SECTION <i>Junior Membership</i> Johnson, Robert B. Mathews, John Thomas	NORTH PACIFIC SECTION <i>Junior Membership</i> Drake, James D. L. Mills, Russel	SOUTHWESTERN SECTION <i>Junior Membership</i> Maguire, W. P.
NEW ENGLAND SECTION <i>Junior Membership</i> McDill, Julia Lee Nutting, Albert D. Smalley, Francis E.	OZARK SECTION <i>Junior Membership</i> Criswold, Gerald Hugh Rasor, Frank W.	

ANNOUNCEMENT OF CANDIDATES FOR MEMBERSHIP

The following names of candidates for membership are referred to Junior Members, Senior Members and Fellows for comment or protest. The list includes all nominations received since the publication of the list in the January JOURNAL, without question as to eligibility; the names have not been passed upon by the Council. Important information regarding the qualifications of any candidate, which will enable the Council to take final action with a knowledge of essential facts, should be submitted to the undersigned before March 10, 1933. Statements on different men should be submitted on different sheets. Communications relating to candidates are considered by the Council as strictly confidential.

FOR ELECTION TO GRADE OF JUNIOR MEMBERSHIP

<i>Name and Education</i>	<i>Title and Address</i>	<i>Proposed by</i>
Ball, Donald R. Iowa State College, B. S. F., '28.	Forest Ranger, Moquah Purchase Unit, U. S. Forest Service, Washburn, Wis.	Wisconsin Section
Butterfield, Kenneth P. U. of N. H., B. S., '30; Yale U., M. F., '32.	Cruiser, Ansonia Water Company, Ansonia, Conn.	New England Section
Camp, John Robert Colo. College B. S. F., '32.	Graduate Assistant, working towards M. F. degree, Dept. of Forestry, Cornell University, Ithaca, N. Y.	New York Section
Chapel, William L., Jr. Cornell U., B. S. F., '32, M. F., '33. (Candidate)	Assistant in the Department of Forestry, Cornell University, Ithaca, N. Y.	New York Section
Cutler, D. Dean Cornell U., B. S. F., '32 M. F., '33. (Candidate)	Graduate student in forestry, Cornell University, Ithaca, N. Y.	New York Section
Donehower, Weston U. of Minn., B. S. F., '31; Cornell U., M. F., '32.	Assistant in research, Dept. of Forestry, Cornell University, Ithaca, N. Y.	New York Section
Fisk, Maynard C. U. of N. H., B. S. F., '28.	District Land Surveyor, New York State Conservation Dept., Canton, N. Y.	New York Section
Heit, Claude Cornell U., B. S. F., '28.	Assistant Foreman, New York State Nursery, Lowville, N. Y.	New York Section
Hendee, Clare W. Mich. State College, B. S. F., '30.	Forest Ranger, Ottawa National Forest, Kenton, Mich.	Wisconsin Section

<i>Name and Education</i>	<i>Title and Address</i>	<i>Proposed by</i>
Hodge, G. H. Dunsmore Business College, '25.	Assistant District Forester, Virginia Forest Service, Clifton Forge, Va.	Allegheny Section
Kresge, Charles B. Cornell U., B. S. F., '27, M. F., '31.	Blister Rust Control Agent, U. S. Dept. of Agric., Gouverneur, N. Y.	New York Section
Lee, Edward N. Iowa State College, B. S. F., '29, Spring Quarter, '31.	Unemployed at present, 318 E. Wil- low Street, Chippewa Falls, Wis.	Wisconsin Section
Maisenhelder, Louis Carl Cornell U., B. S. F., '31, M. F., '32.	Assistant in Research, Dept. of For- estry, Cornell University, Ithaca, N. Y.	New York Section
Mason, Charles E. Cornell U., B. S. F., '31.	Surveyor, N. Y. State Conservation Dept., Albany, N. Y.	New York Section
McConkey, Thomas W. Cornell U., B. S. F., '32.	Graduate Student, Forestry Depart- ment, Cornell University, Ithaca, N. Y.	New York Section
McLaughlin, John S. Colo. Agric. College, B. S. F., '28.	Chief Ranger, Rocky Mountain Na- tional Park, Estes Park, Colorado.	Central Rocky Moun- tain Section
Mead, Charles P. Cornell U., B. S. F., '32.	Assistant in Soil Survey, Agronomy Dept., N. Y. State College of Agric., Ithaca, N. Y.	New York Section
Reynolds, Louis M., Jr. Cornell U., B. S. F., '29.	Member of Forest Engineering Dept., St. Lawrence Corp., Ltd., Montreal, P. Q.	New York Section
Ryerson, Jacob, Jr. N. Y. State College of Forestry, B. S., '31; Yale U., M. F., '32.	Consulting Forester and Dept. Head, Shrubbery Dept., Sears Roebuck and Co., Binghamton, N. Y.	New York Section
Seely, Theodore S. N. Y. State College of Forestry, B. S., '32.	Landscaping, Walton, N. Y.	New York Section
Van Nort, Arthur C. Cornell; Columbia; N. Y. State College of Forestry, B. S. F., '30.	Junior Forester, White Mountain Na- tional Forest, Laconia, N. H.	New England Section
Wilson, R. E. Cornell U., B. S. F., '24.	N. Y. State Conservation Commis- sion, Ithaca, N. Y.	New York Section

FOR ELECTION TO GRADE OF SENIOR MEMBERSHIP

Cook, Lawrence F. N. Y. State College of Forestry, B. S. F., '25. (Junior Member, 1926)	Chief Park Ranger, Sequoia National Park, Three Rivers, Calif.	California Section
Moir, Stuart Mass. State College, B. S., (Engi- neering) '13; Yale U., M. F., '17. (Junior Member, 1921)	Southwestern Manager, Fairchild Aerial Surveys, Inc., Dallas, Tex.	Gulf States Section

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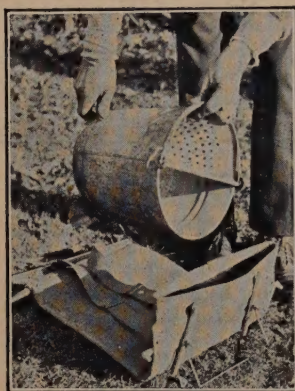
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